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FINAL
CORRECTIVE ACTION PLAN FOR
UST SITE 14131

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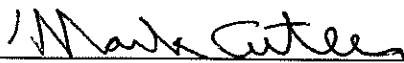
MARINE CORPS BASE
CAMP PENDLETON, CALIFORNIA

DCN: SES-TECH-06-0059

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ABBREVIATIONS AND ACRONYMS

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	Corrective Action Plan
DEH	Department of Environmental Health
EPA	U.S. Environmental Protection Agency
MCB	Marine Corps Base
MCL	Maximum Contaminant Level
Mg/kg	milligram per kilogram
mg/L	milligrams per liter
MNA	monitored natural attenuation
MTBE	methyl tert-butyl ether
NAVFAC SW	Naval Facilities Engineering Command, Southwest
PAH	polynuclear aromatic hydrocarbon
PRG	Preliminary Remediation Goal
PVC	polyvinyl chloride
SES-TECH	Sealaska Environmental Services LLC and Tetra Tech EC, Inc.
SOTA	SOTA Engineering
SPLP	Synthetic Precipitation Leaching Procedure
TPH-d	total petroleum hydrocarbons quantified as diesel
TPH-g	total petroleum hydrocarbons quantified as gasoline
TRPH	total recoverable petroleum hydrocarbons
UST	Underground Storage Tank
VOC	volatile organic compound
Water Board	California Regional Water Quality Control Board
WQO	water quality objective

1.0 INTRODUCTION

This Corrective Action Plan (CAP) for Underground Storage Tank (UST) Site 14131, Marine Corps Base (MCB) Camp Pendleton, California (Figure 1-1), was prepared by SES-TECH, a joint venture between Sealaska Environmental Services LLC and Tetra Tech EC, Inc. This CAP summarizes site investigation activities, soil excavation activities, confirmation soil sampling, and post-excavation groundwater sampling activities conducted in support of efforts to achieve regulatory site closure. This CAP was prepared under the Naval Facilities Engineering Command, Southwest (NAVFAC SW) Contract No. N68711-04-D-1104, Contract Task Order No. 0004.

1.1 SITE IDENTIFICATION

The following list summarizes site identification data:

Site Address:	Building 14131, 14 Area MCB Camp Pendleton, CA 92055
Facility Name:	Battalion Headquarters
San Diego County Department of Environmental Health (DEH) Case No.:	H05939-266
Property Owner and Responsible Party:	United States Marine Corps
MCB Camp Pendleton Contact:	Mr. Chet Storrs, Remediation Branch Manager Assistant Chief of Staff, Environmental Security Building 22165 MCB Camp Pendleton, CA 92055-5008 (760) 725-9774
Remedial Project Manager:	Mr. Bipin Patel NAVFAC SW 1220 Pacific Highway San Diego, CA 92132-5181 (619) 532-4814

1.2 OBJECTIVES

The primary objectives of this CAP include the following:

- Summarize the site history and assess the impacts of contamination detected in soil and groundwater.
- Identify and evaluate relevant potential corrective action alternatives.

- Provide a recommendation regarding the most appropriate corrective action alternative for the site.
- Meet the requirements of the California Regional Water Quality Control Board (Water Board) for the submittal of a CAP.

UST Site 14131 is regulated under the California State Water Resources Control Board Leaking Underground Fuel Tank program as administered by the Water Board, San Diego Region. The document guiding the assessment, remediation, and closure process for the site is the *San Diego County Site Assessment and Mitigation Manual 2004* (DEH, 2004).

The overall purpose of this CAP is to identify and evaluate remedial alternatives for effectively and appropriately addressing contamination at UST Site 14131 and to provide a recommendation regarding corrective action at the site. This CAP contains seven sections, including this introduction as Section 1.0. Section 2.0 includes a description of the site and a summary of previous site activities. Section 3.0 includes an assessment of current soil and groundwater impacts, and Section 4.0 proposes site cleanup goals. Section 5.0 develops a list of alternatives that are appropriate for the site and presents evaluations on their effectiveness, implementability, and cost. A recommendation on the most preferred alternatives is included in Section 6.0, and a list of references used to prepare this CAP is included in Section 7.0.

2.0 SITE DESCRIPTION AND HISTORY

The following sections provide a brief description of the site and a summary of previous activities.

2.1 SITE DESCRIPTION

Building 14131, located southeast of the intersection of 19th Street and E Street in the 14 Area of MCB Camp Pendleton, is a Battalion Headquarters facility (Figure 2-1). A 1,000-gallon single-walled, steel-reinforced concrete UST was installed at the site in 1943 along the southeastern side of the building. The UST stored diesel fuel for the facility heating system.

2.2 INITIAL SITE INVESTIGATION

Due to a failed integrity test of UST 14131 in June 1990, an initial assessment of the site was conducted by Jacobs Engineering in 1992 that included drilling and sampling eight soil borings to a depth of 50 feet below ground surface (bgs). Three groundwater monitoring wells were installed to depths ranging from 23 to 50 feet bgs (Figure 2-2). During the assessment, soil samples were analyzed for total recoverable petroleum hydrocarbons (TRPH) using U.S. Environmental Protection Agency (EPA) Method 418.1 (Table 2-1). TRPH was detected in two samples, with a maximum of 467 milligrams per kilogram (mg/kg) detected at 10 feet bgs in boring B14131-1, located adjacent to the UST (Figure 2-2). Groundwater sampling was completed on March 24 and April 17, 1992, and the samples were analyzed for total petroleum hydrocarbons quantified as diesel (TPH-d) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). TPH-d and BTEX were not detected in any groundwater sample during both events (Table 2-2).

After review of the initial site investigation report, the DEH expressed concerns about the validity of the groundwater samples results. The DEH felt that the water samples were not representative as groundwater levels were above the top of the screened interval in each well.

2.3 UST REMOVAL

In October 1996 the UST and associated product piping (approximately 32 feet) were removed under the inspection of a Hazardous Materials Specialist from the DEH. The tank was 7 feet in height (12 inches extended aboveground) and 6 feet in diameter. Tank excavation extended horizontally approximately 12 feet by 14 feet, and was approximately 7.5 feet deep. Soil samples collected during the tank removal activities were analyzed for TPH-d and total petroleum hydrocarbons quantified as gasoline (TPH-g) (Figure 2-2). TPH-d was detected beneath the tank at 12 feet bgs up to a maximum concentration of 690 mg/kg (Figure 2-2). TPH-g was not detected in any of the soil samples, and groundwater was not encountered.

2.4 ADDITIONAL SITE ASSESSMENT

Additional site assessment activities were completed by SOTA Engineering (SOTA) during two separate field events. In November 1998, five soil borings (MW14131-4, MW14131-5, MW14131-6, B14131-6, and B14131-7) were drilled and sampled to depths ranging from 14 to 15 feet bgs (Figure 2-3). Three of the borings (MW14131-4, MW14131-5, and MW14131-6) were subsequently completed as groundwater monitoring wells.

During the November 1998 field activities, all soil samples were analyzed for TPH-d and TPH-g by a mobile laboratory. The soil sample that exhibited the highest TPH-d concentration was additionally analyzed for methyl tert-butyl ether (MTBE) and BTEX by the mobile laboratory. Approximately 10 percent of the soil samples were subsequently reanalyzed by a stationary laboratory to confirm the mobile laboratory results. In addition, TPH-d, TPH-g, volatile organic compound (VOC), polynuclear aromatic hydrocarbon (PAH), Synthetic Precipitation Leaching Procedure (SPLP)/TPH-d, SPLP/TPH-g, SPLP/VOC, SPLP/PAH, and various physical, biological, and chemical parameter analyses were performed by a stationary laboratory on select soil samples (Table 2-3).

In March 2000, additional soil samples were collected from one soil boring at the location that previously exhibited the highest TPH-d concentrations to analyze the soil for contaminant leachability using the SPLP method. During laboratory data quality validation of the 1998 data, it was determined that soil samples that had been analyzed by SPLP were analyzed after the method holding time. It was therefore necessary to collect new soil samples for SPLP analyses to ensure the validity of the SPLP results. In addition, all samples collected during the March 2000 sampling event were also analyzed by a stationary laboratory for TPH-d, TPH-g, VOCs, and PAHs (Table 2-3).

The boring that had the highest TPH-d concentrations during the November 1998 sampling event was MW14131-4, located in the former tank cavity (TPH-d was detected up to 1,000 mg/kg at 9 feet bgs) (Figure 2-3). In March 2000, new soil boring MW14131-4A was placed within approximately 3 feet of boring MW14131-4 (Figure 2-3) and soil samples were collected at 9, 15, and 20 feet bgs.

Soil samples from MW14131-4A at 9, 15, and 20 feet bgs, showed TPH-d concentrations of 100, 12, and 39 mg/kg, respectively (Table 2-3). Overall, the highest TPH-d concentration identified at the site was 1,000 mg/kg, originally detected in 1998 in soil boring MW14131-4 at 9 feet bgs.

Soil sampling results suggested that the horizontal extent of TPH-d-impacted soil was not more than a 10- to 15-foot radius from the former UST.

Gasoline (BTEX and MTBE)

All soil samples collected at Site 14131 were analyzed for TPH-g by a mobile laboratory. In addition, soil samples from MW14131-4A at 9, 15, and 20 feet bgs were also analyzed for TPH-g by a stationary laboratory. TPH-g was not detected in soil samples analyzed by the mobile laboratory, and TPH-g was detected at a very low concentration, less than 1.2 mg/kg, in soil boring MW14131-4A at 20 feet bgs. TPH-g was also detected in boring MW14131-4A at 9 and 15 feet bgs at estimated (trace) concentrations of 0.4 and 0.2 mg/kg, respectively; however, these concentrations did not have a typical gasoline pattern and most of the peaks in the chromatogram corresponded to the heavier portion of the carbon chain.

MTBE concentrations reported in soil samples were insignificant, at or below the laboratory practical quantitation limits, and none of the reported BTEX concentrations exceeded their respective residential Preliminary Remediation Goals (PRGs) (SOTA, 2001).

Volatile Organic Compounds

Several VOCs were reported in low concentrations in soil borings located in the former tank cavity area at depths of 9, 15, and 20 feet bgs. The highest concentration was estimated at 33 micrograms per kilogram ($\mu\text{g/kg}$) for 1,2,5-trimethylbenzene, which was below the laboratory reporting limit.

Polynuclear Aromatic Hydrocarbons

Since 1,000 mg/kg TPH-d was measured in boring MW14131-4 at 9 feet bgs, this soil sample was selected for additional PAH analysis. Several PAHs were identified at relatively low concentrations. The highest PAH concentration was 458 $\mu\text{g/kg}$ for benz[a]anthracene (SOTA, 2001).

Synthetic Precipitation Leaching Procedure

In March 2000, soil boring MW14131-4A was drilled adjacent to the location of soil boring MW14131-4 (the boring with the highest TPH-d concentration during the 1998 investigation) and soil samples were collected at 9 feet bgs and 15 feet bgs for SPLP/TPH-d analyses. The sample at 9 feet bgs contained SPLP/TPH-d at a concentration of 3.2 milligrams per liter (mg/L), and the sample at 15 feet bgs contained SPLP/TPH-d at 0.9 mg/L.

Groundwater Sampling Results

During the additional site assessment, groundwater samples were collected from the three monitoring wells installed by SOTA (MW4, MW5, and MW6) (SOTA, 2001). The water sample collected from monitoring well MW4 (located adjacent to the former tank cavity) contained TPH-d and TPH-g at concentrations at 6.3 and 0.1 mg/L, respectively (Table 2-2). However, the TPH-g did not have a typical gasoline pattern and most of the peaks in the chromatogram corresponded to

the heavier portion of the carbon chain. TPH-d and TPH-g were not reported in monitoring wells MW5 and MW6.

Several VOCs, including BTEX, were identified at low to trace concentrations in the sample collected from monitoring well MW4, located adjacent to the former tank cavity. Benzene was detected at a trace concentration of 0.7 micrograms per liter ($\mu\text{g/L}$), and MTBE was reported at a concentration of 3.0 $\mu\text{g/L}$ in MW6 (Table 2-2).

In addition, some PAHs were detected at low concentrations in the water sample from monitoring well MW4. Naphthalene was detected at a concentration of 23 $\mu\text{g/L}$. No PAHs were identified in water samples collected from monitoring wells MW5 and MW6.

Groundwater monitoring well locations and a summary of the groundwater sample results are shown in Figure 2-4.

2.5 GROUNDWATER MONITORING WELL ABANDONMENT

Before soil excavation activities began (see Section 2.6 below), existing groundwater monitoring well MW4, located adjacent to the tank cavity in the area to be excavated, was abandoned. The well was abandoned on January 27, 2006, under DEH permit No. LMON 103667. The well was abandoned by overdrilling with an 8-inch-diameter auger and backfilled with bentonite grout to the ground surface. A copy of the well abandonment permit and permit closeout documentation is included in Appendix A.

2.6 SOIL EXCAVATION ACTIVITIES

Between February 6 and February 8, 2006, TPH-d-impacted soil was excavated from the former tank cavity area. The excavation extended horizontally 16 feet by 18.5 feet, and vertically along the eastern half to 14.5 feet bgs, and vertically along the western half to 16 feet bgs. A total of 170 cubic yards of soil were excavated. Groundwater levels measured in nearby monitoring wells during the time of excavation indicated that groundwater was present between 8 and 10 feet bgs. As the excavation proceeded below the groundwater table (up to approximately 6 to 8 feet below groundwater), the soils became wet. The horizontal extent of the excavation was limited to the north because of Building 14131 and was not extended deeper because of concerns for the stability of Building 14131 as a result of the presence of the wet soils below 8 to 10 feet bgs.

Impacted soil removed from the excavation was temporarily stockpiled in accordance with Water Board 95-96 Guidelines (Water Quality Control Board, 1995) prior to being transported off site for disposal. A copy of the stockpile waiver certificate is included in Appendix B. On February 13, 2006, the excavated TPH-d-impacted soil was transported by General Environmental Management to Candelaria Environmental in Anza, California, as non-hazardous waste for disposal. Copies of the Non-hazardous Materials Hauling Manifests are also included in Appendix B.

Backfilling the excavation was completed with fill material from the MCB Camp Pendleton borrow pit (Three Mile Pit). The backfill material was sampled and analyzed for TPH-d (EPA Method 8015M), pH (EPA Method 9045), Title 22 metals (EPA Method 6010B), and asbestos (California Air Resources Board Method 435). Analytical results from the backfill material were within acceptance limits specified in the project Work Plan (SES-TECH, 2005) for all parameters, except thallium (Table 2-4). Thallium was detected at 7.23 mg/kg, and the residential PRG is 5.2 mg/kg (EPA, 2004). Arsenic was also reported in the fill material above its residential PRG; however, the level was below the average background level for arsenic in surface soils at MCB Camp Pendleton (Southwest Division Naval Facilities Engineering Command, 1997). Analytical laboratory reports from the fill material are included in Appendix C. The fill material was placed in 1-foot lifts using a front-end loader, with the goal of a minimal 90 percent compaction. Ninyo and Moore performed compaction tests on each 1-foot lift from 5 feet bgs to surface to ensure that the required compaction level had been achieved. All results were between 94 and 99 percent compaction. The compaction report is included as Appendix D.

A total of 10 confirmation soil samples, plus one duplicate, were collected from the excavation sidewalls and bottom and analyzed for TPH-d. The three samples with the highest TPH-d result were further analyzed for SPLP/TPH-d, SPLP/VOCs, and SPLP/PAHs, pursuant to a request by the Water Board. In addition, one of the samples collected from the bottom of the excavation (14131-091) was also analyzed for total heterotrophic hydrocarbon degraders and diesel oxidizing degraders. The confirmation soil sample results are summarized on Table 2-5 and shown on Figure 2-5. The laboratory analytical reports are included in Appendix C. Soil sample results and the absence of visible hydrocarbon staining indicated that after the soil excavation was complete, no TPH-d contamination was present along the east, west and south sidewalls (TPH-d was non-detect in all samples). However, along the north sidewall, hydrocarbon staining was observed between approximately 8.5 and 12 feet bgs. Two confirmation samples collected from the visibly stained soil along the north sidewall contained 5,800 mg/kg and 2,600 mg/kg TPH-d (Figure 2-5). The excavation could not be extended to the north because of the presence of Building 14131. Visible hydrocarbon staining was not obvious on the bottom of the excavation; however, the two confirmation samples collected from the bottom contained 1,100 mg/kg and 230 mg/kg (duplicate sample contained 850 mg/kg) TPH-d (Figure 2-5).

The three samples with the highest TPH-d results (two from the north sidewall with 5,800 mg/kg and 2,600 mg/kg and one from the bottom with 1,100 mg/kg) were further analyzed for SPLP/TPH-d, SPLP/VOCs, and SPLP/PAHs. SPLP/TPH-d was reported in all three samples ranging from 0.82 to 1.8 mg/L (Table 2-5). Ethylbenzene, the only leachable VOC detected, was reported in one of the samples from the north sidewall at a trace (estimated) concentration of 0.39 µg/L (Table 2-5). Two leachable PAHs were also detected in the same sample collected from the north sidewall. Acenaphthene and fluorene were both reported at a trace concentration of 0.41 µg/L (Table 2-5). The other two soil samples submitted for SPLP/VOC and SPLP/PAH analyses did not contain detectable amounts of leachable VOCs or PAHs.

To further evaluate the vertical extent of TPH-d contamination reported in the bottom confirmation soil samples, soil samples were collected at 1.5 feet, 3.5 feet, and 5.5 feet below the western portion of the bottom of the excavation (or 17.5 feet, 19.5 feet, and 21.5 feet bgs) (Figure 2-5). The samples were analyzed for TPH-d. The laboratory analytical report is included in Appendix C, and the results are summarized on Table 2-5 and Figure 2-5. Results indicated that TPH-d was present in the 17.5-foot sample at 260 mg/kg, but was not detected in the samples collected at 19.5 and 21.5 feet bgs. Results suggest the TPH-d contamination reported in the bottom of the excavation does not extend vertically below the limits of the excavation to any significant extent.

One of the bottom samples (0004-091) was additionally submitted for analyses for the presence of total aerobic heterotrophic bacteria and total diesel oxidizing bacteria (Table 2-5). Results indicated that 4.1E^{+03} total aerobic heterotrophic bacteria, and 3.65E^{+03} total diesel oxidizing bacteria are naturally present in soil. The laboratory analytical report is included in Appendix C. These bacteria are capable of degrading the hydrocarbon contamination at the site and are present at levels above that considered optimal by the EPA (1.0E^{+3}) (EPA, 1995).

2.7 POST-EXCAVATION GROUNDWATER SAMPLING

On March 16, 2006, following completion of soil excavation activities, groundwater monitoring wells MW3, MW5, and MW6 were sampled. Wells MW1 and MW4 were previously abandoned, and well MW2 was not sampled because the top of the well screen was approximately 20 feet below the water table. Immediately prior to sampling, the depth to groundwater was measured in each well (Table 2-6). Groundwater samples were collected using low-flow sampling methodology and were analyzed for TPH-d (EPA Method 8015B), VOCs (EPA Method 8260B), and PAHs (EPA Method 8310).

All results were non-detect for the groundwater samples. No TPH-d, VOCs, or PAHs were detected in any of the wells. The equipment rinsate sample (0004-139) contained 9.2 µg/L of acetone and 0.28 µg/L of chloroform. The analytical results are summarized on Table 2-2, and the laboratory analytical report, chain-of-custody form, field sampling logs, and non-hazardous waste manifest are included in Appendix E.

Groundwater elevation data indicated that groundwater was flowing to the west with a gradient of approximately 0.013 feet/foot. Groundwater elevations are summarized on Table 2-6, and elevation contours are shown on Figure 2-6.

2.8 GROUNDWATER MONITORING WELL INSTALLATION

After soil excavation activities were completed (see Section 2.6), new well MW7 was installed to replace abandoned well MW4 near the former tank cavity. Well MW7 was installed on April 3, 2006, adjacent to the former tank cavity as shown in Figure 2-6. The well permit, boring/well

installation log, and permit closeout documentation for the new well are included in Appendix A. The new well was drilled with a hollow-stem auger drilling rig to 15 feet bgs and was completed with 4-inch-diameter polyvinyl chloride (PVC) blank casing and 0.010-inch PVC screen. The well screen was installed between 5 and 15 feet bgs.

After installation, the new well was developed to clear the screen and filter-pack of fine materials that could possibly clog the screen slots and reduce the effectiveness of the screen. The well was developed by surging, bailing, and pumping. All soil cuttings were transported under a non-hazardous waste manifest to US Ecology in Beatty, Nevada, for disposal, and all decontamination water and well development water were transported under a non-hazardous waste manifest to K-Pure in Rancho Cucamonga, California, for disposal (the waste manifests are included in Appendix E).

After installation of the new well, a topographic survey was performed by a California-licensed surveyor to delineate the location and elevation of the new well. Measurements were to an accuracy of 0.1 foot horizontally and 0.01 foot vertically and were in accordance with North American Datum 83 and North American Vertical Datum (mean sea level) 88, respectively. The results of the survey are included on the boring log in Appendix A.

3.0 ASSESSMENT OF IMPACTS

This section presents information regarding the nature and extent of contamination, site hydrogeology, and an evaluation of potential impacts to nearby resources.

3.1 NATURE AND EXTENT OF CONTAMINATION

Data from site investigation activities indicate that both soil and groundwater have been impacted with petroleum hydrocarbons. Brief descriptions of these impacts are summarized below.

3.1.1 Soil

Soil sample results from site assessment activities (Sections 2.2 and 2.4) suggested the highest levels of diesel contamination extended from the former tank cavity vertically to approximately 12 feet bgs, and did not extend horizontally more than approximately 10 to 15 feet from the former UST.

In February 2006, 170 cubic yards of diesel-impacted soil were removed from the former tank cavity area. The excavation extended horizontally 16 feet by 18.5 feet, and vertically along the eastern half to 14.5 feet bgs, and vertically along the western half to 16 feet bgs. Figure 3-1 is a cross section across the site showing the area of excavation. The horizontal extent of the excavation was limited to the north due to the presence of Building 14131. Laboratory results from confirmation soil samples indicated that TPH-d was not present on the east, west and south sidewalls, but was present along the north sidewall between 2,600 and 5,800 mg/kg, and was present along the bottom of the excavation between 230 and 1,100 mg/kg (Figures 2-5 and 3-1). SPLP/TPH-d results on the three samples with the highest TPH-d levels were relatively low, ranging from 0.82 to 1.8 mg/L.

Additional soil samples collected from beneath the soil excavation indicated that TPH-d was present 1.5 feet below the excavation bottom (17.5 feet bgs) at 260 mg/kg, but was not detected in soil samples collected at both 3.5 feet (19.5 feet bgs) and 5.5 feet (21.5 feet bgs) below the excavation bottom (Figures 2-5 and 3-1).

Based on soil sample data, it is estimated that the remaining diesel-impacted soil along the bottom of the excavation extends vertically to approximately 19 feet bgs. It is also estimated that the remaining hydrocarbon contamination detected along the north sidewall (18.5 feet long) extends between 8.5 feet to 19 feet bgs vertically, and extends horizontally approximately 5 feet beyond the excavation sidewall. Based on these assumptions, the estimated volume of impacted soil remaining along the north sidewall is approximately 36 cubic yards, and the estimated volume of impacted soil remaining along the bottom of the excavation is approximately 54 cubic

yards. The total estimated volume of hydrocarbon-impacted soil at the site is, therefore, approximately 90 cubic yards.

3.1.2 Groundwater

None of the groundwater samples collected during the most recent groundwater sampling event (March 2006) contained TPH-d, VOCs, or PAHs. All results were non-detect for all parameters analyzed. However, new well MW7, located adjacent to the former tank cavity, was not installed for the March 2006 sampling event. Well MW4, which was abandoned before soil excavation activities began and was later replaced by MW7, was located adjacent to the former tank cavity and contained 6.3 mg/L of TPH-d when it was last sampled in 1998 (Table 2-2).

3.2 GEOLOGY AND HYDROGEOLOGY

MCB Camp Pendleton is situated in the Peninsular Ranges Geomorphic Province. In the east, the province consists of mountain ranges (Peninsular Ranges) that divide the Colorado Desert Geomorphic Province from this province. Geomorphic characteristics found in the province include mountain slopes, foothills, inland valleys, coastal valleys, coastal slopes, and coastal plains. Generally, MCB Camp Pendleton contains all of these features, which slope to the west from the mountains near the eastern border of the Base (with the exception of a low coastal mountain range).

The geology at Site 14131 consists of a thin layer of artificial fill material and the Santiago Formation. The fill material primarily consists of dark brown, sandy clay, and extends to a depth of up to approximately 2 feet bgs across the site. Directly under the fill material is the Santiago Formation, which consists of approximately 10 feet of light brown, silty sand followed by a distinctive light green to light olive gray sandy clay (Figure 3-1).

The nearest surface water bodies include a small pond area located approximately 1,000 feet north of the site, and a small tributary to the Pilgrim Creek located approximately 1,000 feet south of the site (MCB Camp Pendleton, 2003).

Annual precipitation in the area ranges from less than 12 to 20 inches, and groundwater at the site typically occurs between approximately 8 to 10 feet bgs. According to the *Water Quality Control Plan for the San Diego Basin* (Regional Water Quality Control Board, 1994), Site 14131 is located within the Mission Hydrologic Subarea of the Lower San Luis Hydrologic Area within the San Luis Rey Hydrologic Unit. Groundwater in this area has beneficial uses including municipal and domestic supply, agricultural supply, industrial process supply, and industrial service supply. However, no groundwater supply wells are located within 1.5 miles of the site.

3.3 EVALUATION OF POTENTIAL IMPACTS

Groundwater at MCB Camp Pendleton has designated municipal/domestic use. To assess the potential that Site 14131 may have to impact groundwater and other nearby resources, the site will be evaluated with criteria related to the effectiveness of the contaminant source removal, site characterization, stability of the groundwater plume, identification of potential nearby sensitive receptors, and whether the site poses a significant risk to human health or the environment. The criteria are presented below, along with applicable information from the site.

1. *The leak has been stopped, and ongoing sources have been removed or remediated to the extent practicable.*
 - The former diesel UST and associated piping were removed from the site in October 1996 (Section 2.3).
 - In February 2006, 170 cubic yards of hydrocarbon-impacted soil were excavated from the former tank cavity area (Section 2.6). After the excavation, soil confirmation samples did not detect TPH-d on the east, west, and south sidewalls; however, TPH-d was detected along the north sidewall and along the excavation bottom. The excavation extended between 6 to 8 feet below groundwater and was limited to the north because of Building 14131. The excavation was not extended deeper because of the presence of the wet soils below 8 to 10 feet bgs and concerns for the stability of Building 14131. It is estimated that approximately 90 cubic yards of hydrocarbon-impacted soil remain at the site.
2. *The site has been adequately characterized.*
 - An initial site investigation was completed in 1992. Eight soil borings were drilled and sampled to 50 feet bgs, and three of the borings were completed as groundwater monitoring wells (Section 2.2).
 - Additional site assessment activities were completed in 1998 and 2000 to further characterize the nature and extent of hydrocarbon contamination in soil and groundwater. A total of six soil borings were drilled and sampled up to 20 feet bgs, and three of the borings were completed as groundwater monitoring wells (Section 2.4).
 - Soil excavation activities were completed in February 2006 to remove as much hydrocarbon-impacted soil as practical (Section 2.6). After the excavation, a total of 10 confirmation soil samples, plus one duplicate, were collected from the excavation sidewalls and bottom to characterize the amount of TPH-d in remaining soils. In addition, analyses were conducted on soil to determine the number of total heterotrophic hydrocarbon degraders and diesel oxidizing degraders present. Results indicated that hydrocarbon-degrading populations are naturally present in subsurface soils at levels above those considered optimal (EPA, 1995).
 - After soil excavation activities were completed a groundwater sampling event was completed (March, 2006), and a new groundwater monitoring well was installed

adjacent to the former tank cavity (MW7). However, new well MW7 was not installed in time for the March 2006 groundwater sampling event.

- Based on the above listed drilling, sampling, and soil excavation activities, it is believed that soil impacts at the site have been adequately characterized. However, it is believed that the Water Board will require additional groundwater sampling (especially at new well MW7) before regulatory closure is approved.

3. *The dissolved hydrocarbon plume is not migrating.*

- During the recently completed groundwater sampling event (March 2006), TPH-d, VOCs, and PAHs were not detected in groundwater. However, replacement well MW7, located adjacent to the former tank cavity, was not installed at the time of sampling.

4. *No water wells, deeper drinking water aquifers, surface water, or sensitive receptors are likely to be impacted.*

- Based on the *Marine Corps Base Camp Pendleton Environmental Operations Map* (MCB Camp Pendleton, 2003), the nearest potential sensitive receptor is a narrow band of rare plant area located approximately 300 feet north of the site. In addition, riparian habitat has been identified 1,000 feet north of the site, and a California gnatcatcher 150-meter buffer zone is located approximately 1,550 feet northeast of the site. None of these areas are expected to be impacted by Site 14131.
- The nearest municipal groundwater supply well is located over 1.5 miles to the west of the site and is not expected to be impacted.
- The nearest surface water includes a small pond area located approximately 1,000 feet north of the site, and a small tributary to the Pilgrim Creek located approximately 1,000 feet south of the site (MCB Camp Pendleton, 2003). Because of the relatively low hydraulic gradients across the site, the apparent relatively low levels of groundwater contamination, and the depth of remaining impacted soil (over 8.5 feet bgs), the potential for nearby surface water bodies to be impacted by Site 14131 is considered insignificant.

5. *The site presents no significant risk to human health.*

- It is extremely unlikely for humans to be exposed to remaining impacted soil because the remaining impacted soil is located over 8.5 feet bgs.
- The only potential for human exposure to contaminants in groundwater is through water supply wells. However, the potential for exposure through groundwater is not anticipated due to the long distance to the nearest supply well (1.5 miles).

6. *The site presents no significant risk to the environment.*

- The nearest potential sensitive receptor is a narrow band of rare plant area located approximately 300 feet north of the site. For the same reasons that nearby surface water is not believed to be at risk, it is believed that the environment and nearby ecological receptors are not at risk. The narrow band of rare plant area is located relatively far from remaining impacted soil, which is over 8.5 feet bgs adjacent to Building 14131.

Based on the above criteria, it is believed that the soil at Site 14131 has been adequately characterized. It is believed that since the volume of remaining hydrocarbon-impacted soil is relatively small, and since there are diesel hydrocarbon degraders naturally present in site soils, the remaining impacted soil does not present a significant risk to human health or the environment. However, due to the limited amount of groundwater sampling that has occurred at the site, especially at new well MW7 located adjacent to the former tank cavity, it is believed the Water Board will require additional groundwater sampling before site closure can be thoroughly evaluated.

4.0 ASSESSMENT OF CLEANUP REQUIREMENTS

Remediation of Site 14131 is monitored by the Water Board, San Diego Region, which has final review and signature authority for closure. The *San Diego County Site Assessment and Mitigation Manual 2004* (DEH, 2004) provides a framework for investigating and remediating releases of petroleum products; however, cleanup goals are specified in other regulations and guidance. Applicable regulations and guidance for UST sites come from state and federal codes, various resolutions, and guidance documents. The following sections focus on cleanup levels and regulations guiding corrective action for residual contamination.

4.1 APPLICABLE CLEANUP LEVELS

Cleanup levels for UST Site 14131 are directly related to the Basin Plan (Regional Water Quality Control Board, 1994). The Basin Plan provides cleanup standards, water quality objectives (WQOs) or Maximum Contaminant Levels (MCLs), for groundwater hydrologic units based on beneficial use designations. A hydrologic unit may be designated for one or more of 23 beneficial uses, such as municipal and domestic supply, agricultural supply, industrial service supply, and so forth. The WQOs for a hydrologic unit must be protective of the most sensitive beneficial use designated for the applicable hydrologic unit. The municipal supply category, which includes sources of drinking water, requires the most protective standards for groundwater.

The Water Board has designated all groundwater at MCB Camp Pendleton located east of Interstate 5 to be current or potential sources of drinking water. Groundwater designated for use “as domestic or municipal supply shall not contain concentrations of chemical constituents in excess of MCLs” nor shall these waters “contain taste and odor producing substances in concentrations which cause nuisance or adversely affect beneficial uses” (Regional Water Quality Control Board, 1994). Therefore, groundwater that is considered a potential source of drinking water cannot contain contaminant concentrations in excess of MCLs (or WQOs) and/or taste and odor water quality thresholds. Cleanup goals for soils are established so that impacted soil does not have the potential to leach contaminants into groundwater at levels above groundwater cleanup goals. Therefore, as summarized in Table 4-1, and based on the above requirements, groundwater and soil cleanup goals for typical diesel fuel constituents are directly related to WQOs and MCLs.

4.2 CORRECTIVE ACTION

In addition to regulatory requirements on cleanup levels, California regulations specify corrective action requirements for restoring sites to appropriate cleanup levels. In particular, California State Water Resources Control Board Resolution No. 92-49 (as amended on April 21, 1994 and October 2, 1996) provides policies and procedures for corrective action of

unauthorized discharges under Water Code Section 13304. This resolution directs that water affected by an unauthorized release attain either background water quality or the best water quality that is reasonable if background water quality cannot be restored; however, it does not require that the requisite level of water quality be met at the time of site closure. Also, according to Resolution 92-49, site cleanup must be “consistent with the maximum benefit to the people of state” considering “all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.” Therefore, corrective action should be reasonable and cost effective with respect to the site-specific conditions.

In Section 5.0, remedial alternatives applicable to UST Site 14131 are identified and evaluated in terms of effectiveness, implementability, and cost.

5.0 IDENTIFICATION AND EVALUATION OF REMEDIAL ALTERNATIVES

This section presents the screening and evaluation process for identifying appropriate remedial alternatives for UST Site 14131. Remedial alternatives screened and evaluated in this CAP are directed at both soil and groundwater. A range of remedial technologies are identified and screened in Section 5.1 in order to select technologies that are expected to be effective, implementable, and cost-effective based on site-specific conditions. Technologies that are not appropriate for the site are eliminated early to streamline the technology evaluation process.

5.1 REMEDIAL TECHNOLOGY SCREENING

The Water Board requires that a minimum of two corrective action strategies be evaluated. To identify the two most appropriate potential technologies for both soil and groundwater, a variety of remedial options were initially screened. A summary of the screening process for soils is included in Table 5-1, and for groundwater, it is included on Table 5-2. The purpose of this screening is to identify and eliminate from further consideration remedial technologies that, because of site-specific conditions or costs, are not the most feasible and/or practical. Based on the screening (see Tables 5-1 and 5-2), the remedial action technologies determined to be the most practical for soil and groundwater at UST Site 14131 are as follows:

Soil:

- Alternative 1: No Further Action
- Alternative 2: Excavation with Off-site Disposal

Groundwater:

- Alternative 1: No Further Action
- Alternative 2: Remediation by Monitored Natural Attenuation

The following sections describe each above identified alternative and include evaluations of effectiveness, implementability, and cost. The evaluation of effectiveness includes consideration of overall protection of human health and the environment and both the long-term and short-term effectiveness of each alternative. Evaluation of the implementability of each alternative includes consideration of the technical and administrative feasibility. The cost evaluation of each alternative is based upon estimates for capital costs and, if applicable, long-term monitoring costs. Water Board acceptance of the CAP requires that the responsible party address the Water Board's comments and concerns for each alternative. The Water Board's acceptance may also not be completed until the public has had a chance to comment on the CAP and the comments have been addressed.

5.2 REMEDIAL ALTERNATIVES FOR SOIL

The following sections describe the two most applicable remedial alternatives for soil at Site 14131, as determined during the alternative screening (Table 5-1).

5.2.1 Alternative 1: No Further Action

Under the No Further Action alternative, no additional soil remediation is proposed for the site. The remaining estimated 90 cubic yards of impacted soil would be left in place, as is. It is, however, presumed that the remaining diesel constituents currently present at the site would be remediated via natural processes. It is implicit in this alternative that, based on the fact that the volume of remaining contamination is relatively minimal, and nearby sensitive receptors, drinking water wells, surface water bodies, and so forth, are not expected to be adversely impacted (see Section 3.3), the expense associated with additional active remediation would be an unnecessary use of public resources.

5.2.1.1 Effectiveness

The No Further Action alternative is expected to provide for permanent long-term reduction of remaining hydrocarbon contamination in soil at Site 14131. This would be effective in consideration of the following:

- The source of the diesel contamination, the leaking UST, has been removed.
- Soil excavation activities removed a majority of diesel-impacted soils. The soil excavation removed approximately 170 cubic yards of impacted soil at the former tank cavity, and extended to between 14.5 to 16 feet bgs, which is between 6 to 8 feet below the groundwater table.
- Laboratory results from soil excavation confirmation soil samples indicated that TPH-d was not detected along the east, west and south sidewalls, but was present along the north sidewall and along the bottom of the excavation. The excavation was limited to the north because of the presence of Building 14131 and was not extended deeper because of the presence of wet soils below 8 to 10 feet bgs and concerns for the stability of adjacent Building 14131.
- It is estimated that approximately 90 cubic yards of hydrocarbon-impacted soil remain at the site. This estimate is based on results from excavation confirmation samples and the assumption that contamination extends up to 5 feet beyond the north sidewall of the excavation under Building 14131.
- A soil sample collected from the bottom of the excavation was analyzed for the presence of total aerobic heterotrophic bacteria and for the presence of total diesel oxidizing bacteria. Results indicated that 4.1E+03 total aerobic heterotrophic bacteria and 3.65E+03 total diesel oxidizing bacteria are naturally present in site soils. The result for the total aerobic heterotrophic bacteria is over 4 times greater than that considered optimal by EPA (EPA, 1995).

- Based on the distance to the nearest municipal supply well (1.5 miles), and the distance to the nearest sensitive ecological receptor (a narrow band of rare plant area located approximately 300 feet to the north), the likelihood of the diesel contamination remaining in soil at this site impacting human or nearby sensitive ecological receptors is considered insignificant.

Considering current site conditions, the No Further Action alternative is considered an effective alternative that is protective of human health and the environment.

5.2.1.2 Implementability

The No Further Action alternative is easy to implement because no further soil remediation activities would be conducted.

5.2.1.3 Cost

There are no costs associated with the No Further Action alternative for soils.

5.2.2 Alternative 2: Excavation with Off-site Disposal

Excavation with off-site disposal includes removing the remaining TPH-d-impacted soils from along the north sidewall of the previous excavation beneath Building 14131 and extending the depth of the previous excavation, which covered an area approximately 16 feet by 18.5 feet, another 3 to 4.5 feet (to 19 feet bgs). It is estimated that approximately 90 cubic yards of hydrocarbon-impacted soil remain on the site. Alternative screening analyses (Table 5-1) indicated that potential *in situ* remedial options would not be effective due to the relatively impermeable soils present at the site.

Before the excavation would begin, the overhead electrical and fiber optic lines located near the former tank cavity would need to be rerouted. To remove impacted soil along the north sidewall from beneath Building 14131, the building would need to be supported. The excavation would also likely require shoring since the excavation would extend between 9 to 11 feet below groundwater. The excavation would proceed until the presence of hydrocarbon contamination was no longer present and confirmation samples indicated that soil cleanup levels were met. The excavation would then be backfilled and the overhead utilities placed back into their original configuration.

5.2.2.1 Effectiveness

For soils, excavation and off-site disposal is a very effective alternative as it protects human health and the environment by removing the contamination and transferring it to an appropriately permitted facility. Excavation provides a permanent removal of the impacted soils.

5.2.2.2 Implementability

Excavation is a well-established, conventional technology for remediating contaminated soil; however, excavation of the current remaining impacted soils at Site 14131 is considered difficult due to the proximity of Building 14131 and the presence of groundwater at approximately 8 to 10 feet bgs.

5.2.2.3 Cost

The following assumptions were made to develop a cost estimate for the excavation with off-site disposal alternative:

- An estimated 275 cubic yards of soil, including the estimated 90 cubic yards of impacted soil, would be excavated. The impacted soils would be transported off site for disposal as non-hazardous waste.
- An engineering plan would be required to determine the best method of supporting Building 14131 before removing the soil contamination located beneath it.
- Since three sides of Building 14131 are located near the area of excavation, shoring would also be required to protect the building, especially since excavation activities would be required to extend approximately 9 to 11 feet below groundwater.
- The aboveground electrical and fiber optic lines around the former tank cavity would need to be temporarily rerouted prior to the excavation.
- The existing groundwater monitoring well located near the former tank cavity would need to be abandoned and replaced.

The total estimated cost for the excavation with off-site disposal alternative is approximately \$127,000. A general breakdown of the estimated costs is included below:

<u>Task</u>	<u>Estimated Cost</u>
Remedial Action Work Plan (draft and final versions)	\$15,000
Utility rerouting (\$4,000), building support (\$15,000) and shoring (\$10,000)	\$29,000
Abandon and reinstall one groundwater monitoring well	\$5,000
Soil excavation, backfill, and site restoration (approximately 275 cubic yards of soil (estimated \$75/yard)	\$21,000
Confirmation soil sample analyses [10 x \$90 (TPH-d) + 10 x \$180 (VOCs) + 10 x \$176 (PAHs)]	\$4,500
Transport and dispose of contaminated soil (90 cubic yards = 135 tons) (\$55/ton)	\$7,500
Site supervision (2.5 weeks construction supervisor at \$110/hour and health and safety support at \$85/hour)	\$25,000
Site Closure Report (draft and final versions)	\$20,000
Total Estimated Cost:	<u>\$127,000</u>

5.3 REMEDIAL ALTERNATIVES FOR GROUNDWATER

The following sections describe the two most applicable remedial alternatives, as determined during the alternative screening (Table 5-2), for groundwater at Site 14131.

5.3.1 Alternative 1: No Further Action

Under the No Further Action alternative, no groundwater remediation or additional groundwater monitoring would be completed at the site. It is, however, presumed that 1) any remaining TPH-d in groundwater would be remediated via natural processes, and 2) nearby sensitive receptors have been identified and are not anticipated to be adversely impacted.

Results from the most recent groundwater sampling event (March 2006) did not detect TPH-d, VOCs, or PAHs in groundwater. However, groundwater near the contaminant source (the former tank cavity) was not sampled because new well MW7 was not installed at the time of sampling.

5.3.1.1 Effectiveness

The No Further Action alternative for groundwater would be effective in providing protection of human health and the environment in consideration of the following:

- The source of the diesel contamination, the leaking UST, has been removed.
- Soil excavation activities removed a majority of diesel-impacted soils. The soil excavation removed approximately 170 cubic yards of impacted soil down to 6 to 8 feet below the groundwater table.
- Laboratory results from excavation confirmation soil samples indicated that TPH-d was not detected along the east, west and south sidewalls, but was present along the north sidewall and along the bottom of the excavation. It is estimated that approximately 90 cubic yards of hydrocarbon-impacted soil remain at the site. SPLP results from the most impacted confirmation samples were relatively low, between 0.82 and 1.8 mg/L.
- A soil sample collected from the bottom of the excavation, below groundwater, was analyzed for the presence of total aerobic heterotrophic bacteria and total diesel oxidizing bacteria. Results indicated that $4.1E+03$ total aerobic heterotrophic bacteria and $3.65E+03$ total diesel oxidizing bacteria are naturally present in aquifer soils. The result for the total aerobic heterotrophic bacteria is over 4 times greater than that considered optimal by EPA (EPA, 1995).
- Results from recent groundwater sampling (March 2006) were non-detect for TPH-d, VOCs, and PAHs. However, new well MW7, located adjacent to the former tank cavity, was not installed for the sampling event. Results indicate that potential groundwater contamination around the former tank cavity has not migrated downgradient to any significant extent.

- Based on the distance to the nearest municipal supply well (1.5 miles), and the distance to the nearest sensitive ecological receptor (a narrow band of rare plant area located approximately 300 feet to the north), the likelihood of any potential diesel contamination in groundwater impacting human or sensitive ecological receptors is considered insignificant to nonexistent.

Based on current site conditions, the No Further Action alternative is considered an effective alternative for groundwater.

5.3.1.2 Implementability

The No Further Action alternative for groundwater is very easy to implement, as no groundwater remediation or further groundwater monitoring activities would be conducted. After regulatory approval for closure, the groundwater monitoring wells at the site would be properly destroyed.

5.3.1.3 Cost

The only costs associated with the No Further Action alternative for groundwater would be to properly destroy and document the destruction of the existing groundwater monitoring wells. The estimated cost is for the No Further Action alternative is \$14,965. A summary of estimated costs is presented below:

<u>Task</u>	<u>Estimated Cost</u>
Well destruction permits (five wells)	\$665
Drilling subcontractor (\$900 x 5 wells)	\$4,500
Labor for subcontractor coordination and oversight	\$3,500
Transport and dispose of well abandonment debris and soil cuttings	\$2,800
Well destruction documentation	<u>\$3,500</u>
Total Estimated Cost:	<u>\$14,965</u>

5.3.2 Alternative 2: Remediation by Monitored Natural Attenuation

Alternative 2, remediation by monitored natural attenuation (MNA), relies on natural attenuation mechanisms for the remediation of any residual groundwater contamination, and for this alternative, it is proposed that MNA include periodic groundwater monitoring to verify that natural attenuation processes are occurring. With regard to groundwater, natural attenuation is generally defined as a process by which contaminants are degraded, or reduced in concentration, by various naturally occurring processes. Major natural attenuation processes include biodegradation, dispersion, dilution, volatilization, and adsorption. The MNA alternative for groundwater is expected to provide for permanent, long-term reduction of contaminants.

5.3.2.1 Effectiveness

For groundwater, MNA is expected to effectively provide for protection of human health and the environment for the same basic reasons as described above for the No Further Action alternative. Those reasons are reiterated here:

- The source of the diesel contamination, the leaking UST, has been removed.
- Soil excavation activities removed a majority of diesel-impacted soils. The soil excavation removed approximately 170 cubic yards of impacted soil down to 6 to 8 feet below the groundwater table.
- Laboratory results from excavation confirmation soil samples indicated that TPH-d was not detected along the east, west and south sidewalls, but was present along the north sidewall and along the bottom of the excavation. It is estimated that approximately 90 cubic yards of hydrocarbon-impacted soil remain at the site. SPLP results from the most impacted confirmation samples were relatively low, between 0.82 and 1.8 mg/L.
- A soil sample collected from the bottom of the excavation, below groundwater, was analyzed for the presence of total aerobic heterotrophic bacteria and total diesel oxidizing bacteria. Results indicated that 4.1E+03 total aerobic heterotrophic bacteria and 3.65E+03 total diesel oxidizing bacteria are naturally present in aquifer soils. The result for the total aerobic heterotrophic bacteria is over 4 times greater than that considered optimal by EPA (EPA, 1995).
- Results from recent groundwater sampling (March 2006) were non-detect for TPH-d, VOCs, and PAHs. However, new well MW7, located adjacent to the former tank cavity, was not installed for the sampling event. Results indicate that potential groundwater contamination around the former tank cavity has not migrated downgradient to any significant extent.
- Based on the distance to the nearest municipal supply well (1.5 miles), and the distance to the nearest sensitive ecological receptor (a narrow band of rare plant area located approximately 300 feet to the north), the likelihood of any potential diesel contamination in groundwater impacting human or sensitive ecological receptors is considered insignificant to nonexistent.

In consideration of these points, the MNA alternative for groundwater is considered an effective alternative for this site.

5.3.2.2 Implementability

MNA is moderately easy to implement, as no active remediation activities would be conducted. Implementation of MNA would consist of collecting groundwater samples from existing monitoring wells over time to assess contaminant concentrations.

5.3.2.3 Cost

The following assumptions were made to develop a cost estimate for the MNA alternative for groundwater:

- One year of quarterly groundwater monitoring would be required to confirm that levels of groundwater contamination are not increasing.
- Fate and transport modeling will not be required to predict contaminant reduction and/or migration, nor would a contingency plan be required to address the possibility that contaminant reduction will not occur as estimated, because: 1) contaminants are currently not detected in wells located downgradient from the former tank cavity, 2) data suggest the groundwater plume, if present near the former tank cavity, is not expanding, and 3) impacts to human or sensitive ecological receptors are not expected.

The total cost associated with the MNA alternative for groundwater (including properly abandoning and documenting the destruction of the existing groundwater monitoring wells at closure) is approximately \$88,365. A general breakdown of the estimated costs is included below:

<u>Task</u>	<u>Estimated Cost</u>
Quarterly groundwater sampling field labor for 1 year (4 events x 2 persons x 10 hrs/event x \$85/hr)	\$6,800
Groundwater sample analysis (7 samples TPH-d (\$90)/event + 8 samples VOCs (\$180)/event + 7 samples PAHs (\$176)/event)	\$13,200
Transport and dispose well purge water (4 events)	\$3,400
Quarterly Groundwater Sampling Reports (\$9,500/report x 4 reports)	\$38,000
Closure Report	\$12,000
Well destruction and documentation (see Section 5.3.1.3)	<u>\$14,965</u>
Total Estimated Cost:	<u>\$88,365</u>

6.0 RECOMMENDATIONS

The No Further Action alternative for soil and the MNA alternative for groundwater are the requested alternatives for UST Site 14131. This request is based on the following:

- **Source Removal.** In 1996, the UST and associated piping were removed from the site. In February 2006, TPH-d-impacted soil was excavated (170 cubic yards) to the extent practical around the former tank cavity. After the excavation, soil confirmation samples did not detect TPH-d on the east, west, and south sidewalls; however, TPH-d was detected along the north sidewall and along the excavation bottom. The excavation extended between 6 to 8 feet below groundwater and was limited to the north because of Building 14131. The excavation was not extended deeper because of the presence of wet soils below 8 to 10 feet bgs and concerns for the stability of the building. It is estimated that approximately 90 cubic yards of hydrocarbon-impacted soil remain at the site (Section 3.1.1). The costs estimated to remove the remaining impacted soil from beneath the building and from beneath the recently completed excavation backfill are considered high (Section 5.2.2.3) and are not believed to be warranted for the relatively small amount of hydrocarbon contamination remaining.

It is believed that since that the remaining small volume of impacted soil does not present a significant risk to human health or the environment (see Section 3.3) and naturally occurring total aerobic heterotrophic bacteria and total diesel oxidizing bacteria in soil are present at levels above those considered optimal (EPA, 1995), No Further Action for soil is an effective and cost efficient alternative for Site 14131.

- **Extent of Remaining Soil Contamination.** Soil excavation activities around the former tank cavity extended horizontally 16 feet by 18.5 feet, and vertically along the eastern half to 14.5 feet bgs, and vertically along the western half to 16 feet bgs. Laboratory results from excavation confirmation soil samples indicated that TPH-d remained only along the north sidewall and along the bottom. Soil samples collected from beneath the bottom of the excavation indicated that TPH-d-impacted soil extended approximately 3 feet below the bottom of the excavation (Section 2.6), and it is estimated that the remaining hydrocarbon contamination detected along the north sidewall extends horizontally approximately 5 feet from the excavation sidewall. It is estimated that approximately 90 cubic yards of TPH-d-impacted soil remain at the site.
- **Groundwater Plume Stability.** Groundwater at the site has been sampled three times, once in 1992, once in 1998, and once in 2006. During the most recent event (March 2006), all results were non-detect; no TPH-d, VOCs, or PAHs were detected in any of the wells. However, new well MW7, located adjacent to the former tank cavity, was not installed for the March 2006 sampling event. Well MW4, which was abandoned before soil excavation activities began and was later replaced by MW7, was located adjacent to the former tank cavity and contained 6.3 mg/L of TPH-d when it was last sampled in 1998. Current data suggest that potential groundwater contamination around the former tank cavity has not migrated downgradient to any significant extent.
- **Risk.** Based on the distance to the nearest municipal supply well (1.5 miles), the distance to the nearest surface water (includes a small pond approximately 1,000 feet

to the north, and a small tributary to Pilgrim Creek approximately 1,000 feet to the south), the absence of groundwater contaminants downgradient of the former tank cavity, the low volume of remaining soil contamination (estimated 90 cubic yards), the distance to the nearest sensitive ecological receptor (a narrow band of rare plant area located approximately 300 feet north of the site), and the presence of total heterotrophic hydrocarbon degraders and diesel oxidizing degraders in subsurface soils at levels above those considered optimal (suggesting that natural attenuation is actively occurring at the site), the likelihood of diesel contamination from this site impacting human or sensitive ecological receptors is considered extremely small to negligible.

- **Cost.** The costs for excavation with off-site disposal for the remaining estimated 90 cubic yards of impacted soils (\$127,000) are significant when considering that the remaining impacted soil is not believed to be a threat to human health or nearby sensitive ecological receptors. Such expenditures for additional active soil remediation are believed to be an unnecessary use of public resources. Perhaps equally or more importantly, such expenditures would, in light of MCB Camp Pendleton's limited budget for environmental remediation, result in decreased availability of funds for remediation of sites that actually pose risks to human health or the environment.

The costs for MNA for groundwater (\$88,365) are considered necessary to evaluate potential seasonal changes in water quality (especially near the former tank cavity), and to establish a high degree of certainty in the data to support regulatory site closure.

- **Time Frame.** Data collected for this site indicate that the tank has been removed, the majority of contaminated soils have been removed, the remaining impacted soils (estimated 90 cubic yards) are not believed to be a significant source of continued contaminant release (relatively low SPLP results), groundwater around the former tank cavity is not impacted, conditions for biodegradation are favorable (hydrocarbon degraders are naturally present in aquifer soils at levels considered optimal [EPA, 1995]), contaminants are extremely unlikely to impact nearby sensitive receptors and the nearest municipal supply well (located 1.5 miles away), and groundwater in the immediate area is not expected to be used for any purpose in the foreseeable future. In consideration of all of the available information, it is believed that residual hydrocarbon contamination will be naturally remediated within a reasonable time frame.

In summary, since there are no known current pathways for exposure to the remaining relatively small volume of impacted soils (estimated 90 cubic yards), remaining impacted soils are not believed to be a significant source of continued contaminant release (relatively low SPLP results), and the costs associated with removing the remaining impacted soils is considered significant, the No Further Action alternative for soils is requested for Site 14131. However, since seasonal groundwater quality data have not been obtained from the site, especially from near the former contaminant source (the former tank cavity), the MNA alternative is requested for groundwater. It is recommended that 1 year of quarterly groundwater sampling be completed to evaluate potential seasonal changes in groundwater quality, and to obtain a high degree of confidence that any potential groundwater contamination is not expanding and that natural attenuation is occurring.

7.0 REFERENCES

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TABLES

TABLE 2-1

**INITIAL SITE ASSESSMENT SOIL SAMPLE RESULTS (1991/1992),
UST SITE 14131, MCB CAMP PENDLETON, CALIFORNIA**

Date	Sample ID	TPH-d	Benzene	Toluene	Ethylbenzene	Xylenes	TRPH
12/3/91	B14131-1-5						<10
12/3/91	B14131-1-10						467
12/3/91	B14131-1-15						<10
12/3/91	B14131-1-19						<10
1/30/92	B14131-2-5						<10
1/30/92	B14131-2-10						<10
1/30/92	B14131-2-15						<10
1/30/92	B14131-2-15D						23
1/30/92	B14131-2-20						<10
1/30/92	B14131-3-5						<10
1/30/92	B141313-10						<10
1/30/92	B141313-15						<10
1/30/92	B141313-19						<10
1/30/92	B14131-4-5						<10
1/30/92	B14131-4-10						<10
1/30/92	B14131-4-15						<10
1/30/92	B14131-4-19						<10
1/30/92	B14131-5-5						<10
1/30/92	B14131-5-10	NA	NA	NA	NA	NA	<10
1/30/92	B14131-5-10D						<10
1/30/92	B14131-5-15						<10
1/30/92	B14131-5-19						<10
2/12/92	MW14131-1-5						<10
2/12/92	MW14131-1-15						<10
2/12/92	MW14131-1-45						<10
2/12/92	MW14131-1-50						<10
2/14/92	MW14131-2-5						<10
2/14/92	MW14131-2-10						<10
2/14/92	MW14131-2-40						<10
2/14/92	MW14131-2-45						<10
2/14/92	MW14131-2-45						<10
2/18/92	MW14131-3-5						<10
2/18/92	MW14131-3-10						<10
2/18/92	MW14131-3-15						<10
2/18/92	MW14131-3-20						<10
2/18/92	MW14131-3-23						<10

Notes:

MCB - Marine Corps Base

NA - not analyzed

TPH-d - total petroleum hydrocarbons quantified as diesel

TRPH - total recoverable petroleum hydrocarbons

UST - Uncderground Storage Tank

TABLE 2-2

SUMMARY OF HISTORICAL GROUNDWATER SAMPLING RESULTS,
UST SITE 14131, MCB CAMP PENDELTON, CALIFORNIA

Well ID	Date Sampled	Sample ID	TPH-d mg/L	TPH-g mg/L	TPH-mo mg/L	VOCs (µg/L)																PAHs (µg/L)								
						Benzene	Toluene	Ethylbenzene	Xylenes (total)	MTBE	Acetone	Chloroform	N-Butylbenzene	sec-Butylbenzene	Isopropylbenzene	p-Isopropyltoluene	Naphthalene	N-propylbenzene	Tetrachloroethene	1,2,4-Trimethylbenzene	Acenaphthene	Anthracene	Benz[a]anthracene	Chrysene	Fluorene	Naphthalene	Phenanthrene	Pyrene		
1992 Initial Site Investigation																														
MW1	03/24/92	MW14131-1	--	NA	NA	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
	04/17/92		--	NA	NA	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
MW2	03/24/92	MW14131-2	--	NA	NA	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
	04/17/92		--	NA	NA	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
MW3	03/24/92	MW14131-3	--	NA	NA	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
	04/17/92		--	NA	NA	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
1998 Site Investigation																														
MW4	12/02/98	MW14131-4	6.3	0.1 ⁽¹⁾	0.7	0.7J	--	1.0J	1.3J	--	41J	--	0.7J	0.6J	0.7J	0.4J	4.0J	0.8J	2.0J	0.6J	5.0J	0.5	0.4	0.1J	8.3	23	0.2J	0.75		
MW5	12/02/98	MW14131-5	--	--	--	--	--	--	--	--	31J	--	--	--	--	--	--	--	0.9J	--	--	--	--	--	--	--	--			
MW6	12/02/98	MW14131-6	--	--	--	--	--	--	--	3J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
March 2006 Groundwater Sampling Event																														
MW3	03/16/06	0004-136	--	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
MW5	03/16/06	0004-135	--	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
MW6	03/16/06	0004-137	--	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
		0004-138 (Dup)	--	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			

Notes:
⁽¹⁾ - Not a typical gas pattern. Most peaks on chromatogram correspond to heavier portion of carbon chain.
-- - Not detected above project reporting limits
µg/L - micrograms per liter
Dup - duplicate sample
J - estimated value
MCB - Marine Corps Base
mg/L - milligrams per liter
MTBE - methyl tert-butyl ether
NA - not analyzed
PAH - polynuclear aromatic hydrocarbon
TPH-d - total petroleum hydrocarbons quantified as diesel
TPH-g - total petroleum hydrocarbons quantified as gasoline
TPH-mo - total petroleum hydrocarbons quantified as motor oil
UST - Underground Storage Tank
VOC - volatile organic compounds

TABLE 2-3

**SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL,
UST SITE 14131, MCB CAMP PENDELTON, CALIFORNIA**

Component Analyzed	Method	Unit	PQL	MW14131-4 @ 9'	MW14131-4A @ 9'	MW14131-4A @ 15'	MW14131-4A @ 20'
Date Collected				11/5/98	3/11/00	3/11/00	3/11/00
Stationary Laboratory Analysis - TPH-d, TPH-g, MTBE, BTEX							
Dilution Factor (Gasoline, BTEX, and MTBE)					1	1	1
Gasoline	M8015V	mg/kg	1	NA	0.4J ^(a)	0.2J ^(a)	<1.2
Benzene	8020	µg/kg	5		--	--	--
Ethylbenzene	8020	µg/kg	5		--	--	--
Toluene	8020	µg/kg	5		--	--	--
o-Xylene	8020	µg/kg	5		--	--	--
m/p-Xylene	8020	µg/kg	10		--	--	--
Xylenes (Total)	8020	µg/kg	--		--	--	--
Methyl-t-butyl ether (MTBE)	8020	µg/kg	25		--	--	--
Dilution Factor (Diesel & Motor Oil)					1	1	1
Diesel	M8015E	mg/kg	10		100	12	39
Motor oil	M8015E	mg/kg	10		21	2J	4J
Stationary Laboratory Results - Volatile Organic Compounds							
Dilution Factor				10	1	1	1
Acetone	8260B	µg/kg	100	<1100	81J	71J	77J
Benzene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Bromobenzene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Bromochloromethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Bromodichloromethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Bromoform	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Bromomethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
2-Butanone (MEK)	8260B	µg/kg	100	<1100	<130	<120	7J
n-Butylbenzene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
sec-Butylbenzene	8260B	µg/kg	5	20J	<6.3	<6.1	<5.9
tert-Butylbenzene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Carbon disulfide	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Carbon tetrachloride	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Chlorobenzene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Chlorodibromomethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,2-Dibromomethane (EDB)	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Dibromomethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,2-Dichlorobenzene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,3-Dichlorobenzene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,4-Dichlorobenzene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9

TABLE 2-3

**SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL,
UST SITE 14131, MCB CAMP PENDELTON, CALIFORNIA**

Component Analyzed	Method	Unit	PQL	MW14131-4 @ 9'	MW14131-4A @ 9'	MW14131-4A @ 15'	MW14131-4A @ 20'
Date Collected				11/5/98	3/11/00	3/11/00	3/11/00
Dichlorodifluoromethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,1-Dichloroethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,2-Dichloroethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,1-Dichloroethene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
cis-1,2-Dichloroethene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
trans-1,2-Dichloroethene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,2-Dichloropropane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,3-Dichloropropane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
2,2-Dichloropropane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,1-Dichloropropene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
cis-1,3-Dichloropropane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
trans-1,3-Dichloropropene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Ethylbenzene	8260B	µg/kg	5	9J	<6.3	<6.1	<5.9
Hexachlorobutadiene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Isopropylbenzene (Cumene)	8260B	µg/kg	5	9J	<6.3	<6.1	<5.9
p-Isopoyltoluene	8260B	µg/kg	5	13J	<6.3	<6.1	<5.9
Methylene chloride	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
4-Methyl-2-pentanone (MIBK)	8260B	µg/kg	50	<570	<6.3	<6.1	<5.9
Methyl tert-butyl ether (MTBE)	8260B	µg/kg	10	<110	<13	<12	<12
Naphthalene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
n-Propylbenzene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Styrene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,1,1,2-Tetrachloroethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,1,1,2,2-Tetrachloroethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Tetrachlorethene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Toluene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,2,3-Trichlorobenzene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,2,4-Trichlorobenzene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,1,1-Trichloroethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,1,2-Trichloroethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Trichloroethene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Trichlorofluoromethane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,2,3-Trichloropropane	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,2,4-Trimethylbenzene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
1,3,5-Trimethylbenzene	8260B	µg/kg	5	33J	<6.3	<6.1	<5.9

TABLE 2-3

**SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL,
UST SITE 14131, MCB CAMP PENDELTON, CALIFORNIA**

Component Analyzed	Method	Unit	PQL	MW14131-4 @ 9'	MW14131-4A @ 9'	MW14131-4A @ 15'	MW14131-4A @ 20'
Date Collected				11/5/98	3/11/00	3/11/00	3/11/00
Vinyl Chloride	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
o-Xylene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
m/p-Xylene	8260B	µg/kg	5	<57	<6.3	<6.1	<5.9
Xylenes (Total)	8260B	µg/kg	5	--	--	--	--
Stationary Laboratory Results - Polynuclear Aromatic Hydrocarbons (PAHs)							
Dilution Factor				5	1	1	1
Acenaphthene	8310	µg/kg	50	<290	<63	<61	<59
Acenaphthylene	8310	µg/kg	20	<110	<25	<2.4	<24
Anthracene	8310	µg/kg	2	33	2J	<2.4	<2.4
Benz[a]anthracene	8310	µg/kg	2	458	10	<2.4	<2.4
Benzo[a]pyrene	8310	µg/kg	2	<11	<2.5	<2.4	<2.4
Benzo[b]fluoranthene	8310	µg/kg	2	<11	<2.5	<2.4	<2.4
Benzo[g,h,i]perylene	8310	µg/kg	2	120	<2.5	<2.4	<2.4
Benzo[k]fluoranthene	8310	µg/kg	2	<11	<2.5	<2.4	<2.4
Chrysene	8310	µg/kg	2	70	<2.5	<2.4	<2.4
Dibenz[a,h]anthracene	8310	µg/kg	5	270	<6.3	<6.1	<5.9
Flouranthene	8310	µg/kg	2	170	<2.5	<2.4	<2.4
Flourene	8310	µg/kg	2	97	<2.5	<2.4	<2.4
Indeno[1,2,3-cd]pyrene	8310	µg/kg	2	<11	<2.5	<2.4	<2.4
Naphthalene	8310	µg/kg	50	<290	<63	<61	<59
Phenanthrene	8310	µg/kg	2	<11	5.3	<2.4	<2.4
Pyrene	8310	µg/kg	2	342	<2.5	<2.4	<2.4
Stationary Laboratory Results - SPLP TPH-d, TPH-g, MTBE, BTEX							
Dilution Factor (Gasoline, BTEX, and MTBE)					1	1	
Gasoline	8021B	µg/L	0.05		0.51 ^(a)	1.01 ^(a)	
Benzene	8021B	µg/L	0.5		0.1J	0.1J	
Ethylbenzene	8021B	µg/L	0.5		<0.5	<0.5	
Toluene	8021B	µg/L	0.5	NA	0.5	0.5J	NA
o-Xylene	8021B	µg/L	0.5		0.6	0.3J	
m/p-Xylene	8021B	µg/L	1		0.7J	1	
Methyl tert-butyl ether (MTBE)	8021B	µg/L	5		2J	3J	
Dilution Factor (Diesel and Motor Oil)					1	1	
Diesel	M8015E	mg/L	0.5		3.2	0.9	
Motor oil	M8015E	mg/L	0.5		0.2J	0.2J	

TABLE 2-3

**SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL,
UST SITE 14131, MCB CAMP PENDELTON, CALIFORNIA**

Component Analyzed	Method	Unit	PQL	MW14131-4 @ 9'	MW14131-4A @ 9'	MW14131-4A @ 15'	MW14131-4A @ 20'
Date Collected				11/5/98	3/11/00	3/11/00	3/11/00
Stationary Laboratory Results - SPLP Volatile Organics							
Dilution Factor					1	1	
Acetone	8260B	µg/L	100		16J	10J	
Benzene	8260B	µg/L	5		<5	<5	
Bromobenzene	8260B	µg/L	5		<5	<5	
Bromochloromethane	8260B	µg/L	5		<5	<5	
Bromodichloromethane	8260B	µg/L	5		<5	<5	
Bromoform	8260B	µg/L	5		<5	<5	
Bromomethane	8260B	µg/L	5		<5	<5	
2-Butanone (MEK)	8260B	µg/L	100		5J	5J	
n-Butylbenzene	8260B	µg/L	5		<5	<5	
sec-Butylbenzene	8260B	µg/L	5		2J	<5	
tert-Butylbenzene	8260B	µg/L	5		<5	<5	
Carbon disulfide	8260B	µg/L	5		<5	<5	
Carbon tetrachloride	8260B	µg/L	5		<5	<5	
Chlorobenzene	8260B	µg/L	5		<5	<5	
Chlorodibromomethane	8260B	µg/L	5		<5	<5	
Chloroethane	8260B	µg/L	5		<5	<5	
Chloroform	8260B	µg/L	5	NA	<5	<5	NA
Chloromethane	8260B	µg/L	5		<5	<5	
2-Chlorotoluene	8260B	µg/L	5		<5	<5	
4-Chlorotoluene	8260B	µg/L	5		<5	<5	
1,2-Dibromo-3-chloropropane (DB)	8260B	µg/L	5		<5	<5	
1,2-Dibromomethane (EDB)	8260B	µg/L	5		<5	<5	
Dibromomethane	8260B	µg/L	5		<5	<5	
1,2-Dichlorobenzene	8260B	µg/L	5		<5	<5	
1,3-Dichlorobenzene	8260B	µg/L	5		<5	<5	
1,4-Dichlorobenzene	8260B	µg/L	5		<5	<5	
Dichlorodifluoromethane	8260B	µg/L	5		<5	<5	
1,1-Dichloroethane	8260B	µg/L	5		<5	<5	
1,2-Dichloroethane	8260B	µg/L	5		<5	<5	
1,1-Dichloroethene	8260B	µg/L	5		<5	<5	
cis-1,2-Dichloroethene	8260B	µg/L	5		<5	<5	
trans-1,2-Dichloroethene	8260B	µg/L	5		<5	<5	

TABLE 2-3

**SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL,
UST SITE 14131, MCB CAMP PENDELTON, CALIFORNIA**

Component Analyzed	Method	Unit	PQL	MW14131-4 @ 9'	MW14131-4A @ 9'	MW14131-4A @ 15'	MW14131-4A @ 20'
Date Collected				11/5/98	3/11/00	3/11/00	3/11/00
1,2-Dichloropropane	8260B	µg/L	5		<5	<5	
1,3-Dichloropropane	8260B	µg/L	5		<5	<5	
2,2-Dichloropropane	8260B	µg/L	5		<5	<5	
1,1-Dichloropropene	8260B	µg/L	5		<5	<5	
cis-1,3-Dichloropropane	8260B	µg/L	5		<5	<5	
trans-1,3-Dichloropropene	8260B	µg/L	5		<5	<5	
Ethylbenzene	8260B	µg/L	5		<5	<5	
Hexachlorobutadiene	8260B	µg/L	5		<5	<5	
Isopropylbenzene (Cumene)	8260B	µg/L	5		0.9J	<5	
p-Isopropyltoluene	8260B	µg/L	5		3J	<5	
Methylene chloride	8260B	µg/L	5		0.8J	0.7J	
4-Methyl-2-pentanone (MIBK)	8260B	µg/L	50		<50	<50	
Methyl tert-butyl ether (MTBE)	8260B	µg/L	10		<10	<10	
Naphthalene	8260B	µg/L	5		<5	<5	
n-Propylbenzene	8260B	µg/L	5		2J	<5	
Styrene	8260B	µg/L	5		<5	<5	
1,1,1,2-Tetrachloroethane	8260B	µg/L	5		<5	<5	
1,1,2,2-Tetrachloroethane	8260B	µg/L	5		<5	<5	
Tetrachlorethene	8260B	µg/L	5		<5	<5	
Toluene	8260B	µg/L	5		<5	<5	
1,2,3-Trichlorobenzene	8260B	µg/L	5		<5	<5	
1,2,4-Trichlorobenzene	8260B	µg/L	5		<5	<5	
1,1,1-Trichloroethane	8260B	µg/L	5		<5	<5	
1,1,2-Trichloroethane	8260B	µg/L	5		<5	<5	
Trichloroethene	8260B	µg/L	5		<5	<5	
Trichlorofluoromethane	8260B	µg/L	5		<5	<5	
1,2,3-Trichloropropane	8260B	µg/L	5		<5	<5	
1,2,4-Trimethylbenzene	8260B	µg/L	5		0.9J	<5	
1,3,5-Trimethylbenzene	8260B	µg/L	5		<5	<5	
Vinyl Chloride	8260B	µg/L	5		<5	<5	
o-Xylene	8260B	µg/L	5		<5	<5	
m/p-Xylene	8260B	µg/L	5		<5	<5	

TABLE 2-3

**SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL,
UST SITE 14131, MCB CAMP PENDELTON, CALIFORNIA**

Component Analyzed	Method	Unit	PQL	MW14131-4 @ 9'	MW14131-4A @ 9'	MW14131-4A @ 15'	MW14131-4A @ 20'
Date Collected				11/5/98	3/11/00	3/11/00	3/11/00
Stationary Laboratory Results - SPLP Polynuclear Aromatic Hydrocarbons (PAHs)							
Dilution Factor					1	1	
Acenaphthene	8310	µg/L	5		<5	<5	
Acenaphthylene	8310	µg/L	2		<2	<2	
Anthracene	8310	µg/L	0.2		<0.2	<0.2	
Benz[a]anthracene	8310	µg/L	0.2		0.1J	<0.2	
Benzo[a]pyrene	8310	µg/L	0.2		<0.2	<0.2	
Benzo[b]fluoranthene	8310	µg/L	0.2		<0.2	<0.2	
Benzo[g,h,i]perylene	8310	µg/L	0.2		<0.2	<0.2	
Benzo[k]fluoranthene	8310	µg/L	0.2		<0.2	<0.2	
Chrysene	8310	µg/L	0.2		<0.2	<0.2	
Dibenz[a,h]anthracene	8310	µg/L	0.5		<0.5	<0.5	
Fluoranthene	8310	µg/L	0.2		<0.2	<0.2	
Fluorene	8310	µg/L	1		<1	<1	
Indeno[1,2,3-cd]pyrene	8310	µg/L	0.2		<0.2	<0.2	
Naphthalene	8310	µg/L	5		<5	<5	
Phenanthrene	8310	µg/L	1		0.2J	<1	
Pyrene	8310	µg/L	0.2		<0.2	<0.2	
Stationary Laboratory Results - Physical/Chemical/Biological/Indicators							
Heterotrophic Plate Count	SM9215	CFU/10g	1	510,000			
Hydrocarbon Degradation	SM9215A	MPN/g	1	>1,100			
Moisture (Percent in Soil)	ASTM D 2216	%Moisture	0.5	12.3			
pH	9045	pH unit	0.01	7.73			
Ammonia (NH ₄)	350.2	mg/kg	5	52			
Nitrate (NO ₃) as N	SM4500NO3D	mg/kg	5	4J	NA	NA	NA
Eh	ASTM 1498	Mv	1	302			
Orthophosphate	365.2	mg/kg	0.2	55.8			
Sulfate SO ₄	375.4	mg/kg	10	67			
Iron, Fe	6010	mg/kg	3	6520			
Manganese, Mn	6010	mg/kg	0.5	58.6			

TABLE 2-3

**SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL,
UST SITE 14131, MCB CAMP PENDELTON, CALIFORNIA**

Component Analyzed	Method	Unit	PQL	MW14131-5 @ 15'	MW14131-6 @ 15'	MW14131-7 @ 15'
Date Collected				11/6/98	11/6/98	11/6/98
Stationary Laboratory Analysis - TPH-d, TPH-g, MTBE, BTEX						
Dilution Factor (Gasoline, BTEX, and MTBE)				1	1	1
Gasoline	M8015V	mg/kg	1	--	--	--
Benzene	8020	µg/kg	5	<5	<5	<5
Ethylbenzene	8020	µg/kg	5	<5	<5	<5
Toluene	8020	µg/kg	5	<5	<5	<5
o-Xylene	8020	µg/kg	5	<5	<5	<5
m/p-Xylene	8020	µg/kg	10	<10	<10	<10
Xylenes (Total)	8020	µg/kg	--	--	--	--
Methyl-t-butyl ether (MTBE)	8020	µg/kg	25	--	--	--
Dilution Factor (Diesel and Motor Oil)				1	1	1
Diesel	M8015E	mg/kg	10	24	<10	<10
Motor oil	M8015E	mg/kg	10	<10	4J	4J

Notes:

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Shaded columns with "NA" indicates "Not Analyzed" for shaded analytes

-- - Analysis is not required

(a) - Not a typical gas pattern. Most of the peaks in the chromatogram correspond to the heavier portion of the chain.

µg/kg - micrograms per kilogram

ASTM - American Society for Testing and materials

BTEX - benzene, toluene, ethylbenzene, and total xylenes

CFU - colony forming unit

g - grain

J - Reported between PQL and MDL

MCB - Marine Corps Base

MDL - Method Detection Limit

mg/kg - milligrams per kilogram

mg/L - micrograms per liter

mg/L - milligrams per liter

Mv - megavolt

NA - not analyzed

PQL - Practical Quantitation Limit

SPLP - Synthetic Precipitation Leaching Procedure

TPH-D - total petroleum hydrocarbons quantified as diesel

TPH-g - total petroleum hydrocarbons quantified as gasoline

UST - Underground Storage Area

TABLE 2-4

**SUMMARY OF EXCAVATION FILL MATERIAL SAMPLE RESULTS,
UST SITE 14131, MCB CAMP PENDLETON, CALIFORNIA**

Sample ID	Date Sampled	TPH-d	Title 22 Metals																	Asbestos	pH
			Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc		
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
0004-070	1/12/2006	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--
0004-071	1/12/2006	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--
0004-072	1/17/2006	ND	ND	2.07	92.2	0.402 J	0.225 J	23.5	5.78	17.7	7.39	1.15 J	ND	16.1	0.784 J	0.624 J	7.23	33.1	49.2	--	8.11
EPA Residential PRGs		N/A	31	0.0062	5400	150	37	30	900	3,100	150	390	23	160	390	390	5.2	78	23,000	--	--

Notes:

-- - not analyzed

EPA - U.S. Environmental Protection Agency

J - estimated value; value falls between the method detection limit and the project reporting limit

MCB - Marine Corps Base

mg/kg - milligrams per kilogram

N/A - not applicable

ND - not detected above laboratory reporting limits

PRG - Preliminary Remediation Goal

TPH-d - total petroleum hydrocarbons quantified as diesel

UST - Underground Storage Tank

TABLE 2-5

**SUMMARY OF SOIL EXCAVATION CONFIRMATION SAMPLE RESULTS,
UST SITE 14131, MCB CAMP PENDLETON, CALIFORNIA**

Sample Number	Date Sampled	Location	Depth	TPH-d mg/kg	SPLP/TPH-d mg/L	Detected SPLP/VOCs µg/L	Detected SPLP/PAHs µg/L	Total Aerobic Heterotrophic Bacteria cfu/g	Total Diesel Oxidizing Bacteria cfu/g
0004-082	2/7/06	East side of north sidewall (shallow)	4 feet	ND	--	--	--	--	--
0004-083	2/7/06	East side of north sidewall (deep)	10 feet	5,800	1.0	ND	ND	--	--
0004-084	2/7/06	East sidewall	10 feet	ND	--	--	--	--	--
0004-085	2/7/06	Excavation bottom (east side)	14.5 feet	1,100	0.82	ND	ND	--	--
0004-086	2/7/06	West side of south sidewall	10 feet	ND	--	--	--	--	--
0004-087	2/7/06	West sidewall	10 feet	ND	--	--	--	--	--
0004-088	2/7/06	West side of north sidewall (shallow)	8 feet	ND	--	--	--	--	--
0004-089	2/7/06	West side of north sidewall (deep)	12 feet	2,600	1.8	0.39J Ethylbenzene	0.41J Acenaphthene 0.41J Fluorene	--	--
0004-090	2/7/06	East side of south sidewall	7 feet	ND	--	--	--	--	--
0004-091	38755	Excavation bottom (west side)	16 feet	230	--	--	--	4,100	3,650
0004-092	2/7/06	Excavation bottom (Dup) (west side)	16 feet	850	--	--	--	--	--
0004-103	2/21/06	Soil Boring B-8	18 feet	260	--	--	--	--	--
0004-104	2/21/06	Soil Boring B-8	20 feet	ND	--	--	--	--	--
0004-105	2/21/06	Soil Boring B-8	22 feet	ND	--	--	--	--	--

Notes:

µg/L - micrograms per liter

-- - not analyzed

cfu/g - colony forming units per gram

Dup - field duplicate sample

J - estimated value; value falls between the method detection limit and the project reporting limit

MCB - Marine Corps Base

mg/kg - milligrams per kilogram

mg/L - milligrams per liter

ND - not detected above laboratory reporting limits

PAH - polynuclear aromatic hydrocarbon

SPLP - Synthetic Precipitation Leachate Procedure

TPH-d - total petroleum hydrocarbons quantified as diesel

UST - Underground Storage Tank

VOC - volatile organic compound

TABLE 2-6

**SUMMARY OF HISTORICAL GROUNDWATER ELEVATIONS,
UST SITE 14131, MCB CAMP PENDLETON, CALIFORNIA**

Monitoring Well ID	Well Screen Interval (feet btoc)	Reference Point (toc) Elevation (feet amsl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)
MW2	32 - 47	294.69	3/24/92	9.64	285.05
			4/17/92	9.18	285.51
MW3	8-23	297.17	3/24/92	8.47	288.70
			4/17/92	8.54	288.63
			3/16/06	9.23	287.94
MW5	5 - 15	295.08	12/2/98	9.43	285.65
			3/16/06	6.77	288.31
MW6	5 - 15	294.74	12/2/98	5.12	289.62
			3/16/06	5.87	288.87
MW7 ⁽¹⁾	5 - 15	295.99	N/A	N/A	N/A

Notes:

(1) - Well installed after March 2006 sampling event

amsl - above mean sea level

btoc - below top of casing

MCB - Marine Corps Base

N/A - not applicable

toc - top of casing

UST - Underground Storage Tank

TABLE 4-1

**PROPOSED CLEANUP OBJECTIVES FOR DIESEL CONTAMINANTS,
UST SITE 14131, MCB CAMP PENDLETON, CALIFORNIA**

Constituent	Groundwater	Soil
TPH-d	100 µg/L ^(a)	SPLP<Groundwater Objective
Benzene	1.0 µg/L ^(b)	SPLP<Groundwater Objective
Toluene	150 µg/L ^(b)	SPLP<Groundwater Objective
Ethylbenzene	680 µg/L ^(b)	SPLP<Groundwater Objective
Total Xylenes	1,750 µg/L ^(b)	SPLP<Groundwater Objective
Benzo[a]pyrene	0.2 µg/L ^(b)	SPLP<Groundwater Objective
Phenanthrene	1.0 µg/L ^(b)	SPLP<Groundwater Objective

Notes:^(a) Secondary taste and odor threshold^(b) Maximum Contaminant Levels

µg/L – micrograms per liter

MCB – Marine Corps Base

SPLP – Synthetic Precipitation Leaching Procedure

TPH-d – total petroleum hydrocarbons quantified as diesel

UST – Underground Storage Tank

TABLE 5-1

**SUMMARY OF SCREENING OF REMEDIAL TECHNOLOGIES FOR SOIL,
UST SITE 14131, MCB CAMP PENDLETON, CALIFORNIA**

General Response Actions	Remedial Technologies	Process Options	Effectiveness	Implementability	Cost	Comments
Active Remediation	<i>In situ</i> biological treatment.	Bioventing/biosparging: Introduce oxygen into the impacted soils in both the vadose zone and saturated zone (most of the remaining contamination is below groundwater), respectively, to increase the biological activity of native microorganisms.	Moderate: Oxygen is typically the limiting factor for aerobic bioremediation, and adding oxygen has been shown to be effective to reduce concentrations of petroleum contaminants adsorbed to soil particles both above and below the water table. However, during groundwater sampling and soil excavation activities, groundwater recharge was very slow, suggesting that soil permeabilities are low, which will inhibit the effectiveness of bioventing/biosparging.	Moderate: Bioventing/biosparging are conventional, well-known technologies. However, bioventing/biosparging in soils with low permeabilities would potentially require numerous injection wells on a tight grid pattern.	Moderate: Depends on the number of injection wells required and the length of time it would take for contaminant levels to drop in the low-permeability soil. It is conservatively assumed that 5+ years of bioventing/biosparging may be required.	Eliminated: Even though bioventing/biosparging is an effective <i>in situ</i> remedial alternative, it is eliminated due to the relatively low volume of hydrocarbon contamination left (estimated 90 cubic yards) and the low-permeability soils. With the low-permeability soils, implementing bioventing/biosparging will likely be difficult, and may not very effective.
Active Remediation	Removal.	Excavation with off-site disposal of remaining impacted soils in both the vadose zone and the saturated zone.	High: Provides long-term effectiveness and permanence. Provides protection of human health and the environment by reducing or eliminating the volume of contaminated soils.	Difficult: Excavation is a conventional and well-established technology; however, the remaining impacted soils are located beneath existing excavation backfill materials and Building 14131. Extensive shoring and building support would be required.	High: An extensive effort would be required to excavate contaminated soil below groundwater adjacent to, and beneath, Building 14131. Extensive shoring and building support would be required.	Retained: Even though excavation would be difficult and expensive to implement, it is considered the best active remedial alternative available for the site.

TABLE 5-1

**SUMMARY OF SCREENING OF REMEDIAL TECHNOLOGIES FOR SOIL,
UST SITE 14131, MCB CAMP PENDLETON, CALIFORNIA**

General Response Actions	Remedial Technologies	Process Options	Effectiveness	Implementability	Cost	Comments
Active Remediation	<i>In situ</i> chemical treatment.	Chemical oxidation: Introduce a chemical oxidant to either destroy or degrade contaminants.	High: Where implementable, this technology has been shown to remediate hydrocarbons in soil in both the vadose zone and the saturated zone. The oxidants used are readily available and treatment time is usually measured in months, as opposed to years.	Difficult: Based on the presence of low permeability soils, which will inhibit the oxidants to readily infiltrate the formation. A pilot test would be recommended. In addition, this technology is not commonly recommended for impacted soils near buildings due to potential exothermic reactions.	Moderately high: Potentially extensive drilling due to low-permeability soils, and extensive monitoring activities because of Building 14131 would increase costs.	Eliminated: Based on the low-permeability soils, this technology may be difficult to implement, or potentially not implementable at all. The low-permeability soils, and adjacent Building 14131 are not well suited for <i>in situ</i> chemical oxidation.
No Further Action	Not applicable.	Not applicable.	High: Natural attenuation has been shown to be effective at petroleum sites for the long-term, permanent removal of hydrocarbon contaminants. Impacted soils both above and below groundwater were removed to the extent practical, and an estimated 90 cubic yards of hydrocarbon-impacted soil remain on site. Since data indicate total aerobic heterotrophic bacteria and total diesel oxidizing bacteria are naturally present in soil at levels above those considered optimal (EPA, 1995), it is believed natural attenuation will occur at the site.	Easy: No additional soil remedial activities would be performed.	Low: Since there would be no additional soil remediation, there would be no additional soil remediation costs. The only cost would be associated with abandoning the groundwater monitoring wells after regulatory site closure.	Retained: It is believed that the relatively low volume (90 cubic yards) of remaining petroleum impacted soils (in both the vadose zone and the saturated zone) will attenuate naturally, especially since total aerobic heterotrophic bacteria and total diesel oxidizing bacteria are naturally present at the site at levels above those considered optimal (EPA, 1995).

Notes:

EPA – U.S. Environmental Protection Agency

MCB – Marine Corps Base

UST – Underground Storage Tank

TABLE 5-2

**SUMMARY OF SCREENING OF REMEDIAL TECHNOLOGIES FOR GROUNDWATER,
UST SITE 14131, MCB CAMP PENDLETON, CALIFORNIA**

General Response Actions	Remedial Technologies	Process Options	Effectiveness	Implementability	Cost	Comments
No Further Action	Not applicable.	Not applicable.	High: Hydrocarbon constituents are readily biodegradable and the nearest municipal supply well is 1.5 miles away. Analytical data indicate that hydrocarbon-degrading bacteria are present in aquifer soils at levels above those considered optimal by the EPA.	Easy: No remedial activities would be performed. Site closure would be complete after the destruction of the existing groundwater monitoring wells.	Low: Costs to destroy existing wells would be relatively low.	Retained: Assumes site closure would be considered appropriate under existing conditions.
Limited Action	Remediation by Monitored Natural Attenuation.	Groundwater monitoring program to verify that contaminant levels are stable or decreasing.	High: Hydrocarbon constituents are readily biodegradable, and the nearest municipal supply well is 1.5 miles away. Analytical data indicate that hydrocarbon-degrading bacteria are present in aquifer soils at levels above those considered optimal by the EPA.	Moderately easy: Consists of periodic groundwater monitoring to assess contaminant disappearance.	Moderate: It is assumed that a 1-year quarterly monitoring program would be sufficient to evaluate seasonal changes and develop a high degree of confidence in the sampling data.	Retained: Relatively easy to implement.
Active Remediation	<i>In situ</i> biological treatment.	Biosparging: Introduce oxygen into the saturated zone by pumping air into the subsurface.	Moderate: Oxygen is typically the limiting factor for aerobic bioremediation, and adding oxygen has been shown to be effective to reduce concentrations of petroleum contaminants below the water table. However, during groundwater sampling and soil excavation activities, groundwater recharge was slow, indicating that soil permeabilities are low, which will inhibit the effectiveness of biosparging.	Moderate: Biosparging is a conventional, well-known technology. However, biosparging in soils with low permeabilities would potentially require numerous injection wells on a tight grid pattern.	Moderate: Depends on the number of injection wells required and the length of time it would take for contaminant levels to drop in the low-permeability soil. It is conservatively assumed that several years of biosparging may be required.	Eliminated: Even though biosparging is an effective <i>in situ</i> remedial alternative, it is eliminated due to the relatively low volume of hydrocarbon contamination left (estimated 90 cubic yards) and the low-permeability soils. With the low-permeability soils, implementing biosparging will likely be difficult.

TABLE 5-2

**SUMMARY OF SCREENING OF REMEDIAL TECHNOLOGIES FOR GROUNDWATER,
UST SITE 14131, MCB CAMP PENDLETON, CALIFORNIA**

General Response Actions	Remedial Technologies	Process Options	Effectiveness	Implementability	Cost	Comments
Active Remediation	<i>In situ</i> biological treatment.	Addition of ORC to the contaminated zone. ORC is a patented formulation of magnesium peroxide that produces a slow, sustained source of oxygen in groundwater, which enhances the ability of indigenous microorganisms to degrade fuel hydrocarbons.	High: Oxygen is typically the limiting factor for aerobic bioremediation, and adding oxygen has been shown to be effective at similar sites. Contrary to biosparging, which relies on pressure to push air into the groundwater, ORC provides high concentrations of molecular oxygen that migrate into the contaminated aquifer via diffusion, and thus is not as restricted by low-permeability soils as biosparging.	Moderate: ORC is applied to the subsurface via push-point injection.	Moderately high: Costs include purchasing ORC and applying it to the subsurface, with periodic groundwater monitoring. Multiple injections would likely be required.	Eliminated: The effort and costs are not justified based on the low-permeability soils and the low potential for adverse impacts from the site to sensitive receptors or nearby water resources (refer to Section 3.3).
Active Remediation	<i>In situ</i> chemical treatment.	Chemical oxidation: Introduce a chemical oxidant into the saturated zone either to destroy or degrade contaminants.	Moderate to high: Technology has been shown to remediate hydrocarbons in groundwater. The oxidants used are readily available, and treatment time is usually measured in months as opposed to years.	Difficult: Impacted saturated soils have low permeability. Also, this technology is not recommended near buildings due to potential exothermic reactions.	Moderate to high: Potentially extensive drilling (due to low permeability soils) and monitoring activities would increase costs.	Eliminated: The effort and costs are not justified based on the low-permeability soils and the low potential for adverse impacts from the site to sensitive receptors or nearby water resources (refer to Section 3.3).

TABLE 5-2

**SUMMARY OF SCREENING OF REMEDIAL TECHNOLOGIES FOR GROUNDWATER,
UST SITE 14131, MCB CAMP PENDLETON, CALIFORNIA**

General Response Actions	Remedial Technologies	Process Options	Effectiveness	Implementability	Cost	Comments
Active Remediation	<i>Ex situ</i> pump and treat.	Groundwater extraction coupled with adsorption/destruction processes such as air stripping, or granular activated carbon and reintroduction of treated water back into the aquifer.	Low: Readily capable of removing contaminants from extracted water. However, hydrocarbon compounds typically adsorb strongly to soil particles, necessitating system operation over an extensive period of time, and disproportionately large groundwater extraction volumes.	Moderate: <i>Ex situ</i> pump and treat is a conventional and established technology; however, an extended period of extraction would likely be required based on the low permeability of the aquifer material.	Very high: High capital and O&M costs. Involves system operation over a potentially long period of time, transport of waste off site, and associated permitting.	Eliminated: Low effectiveness and very high cost eliminate pump and treat as a feasible option.

Notes:

EPA – U.S. Environmental Protection Agency

MCB – Marine Corps Base

O&M – operation and maintenance

ORC – Oxygen Release Compound

UST – Underground Storage Tank

FIGURES

DRAWN BY: MD	CHECKED BY: MC	APPROVED BY: MC	DCN: SES-TECH-06-0059	DRAWING NO: 06005912.DWG
DATE: 02/15/06	REV: REVISION 0		CTD: #0004	

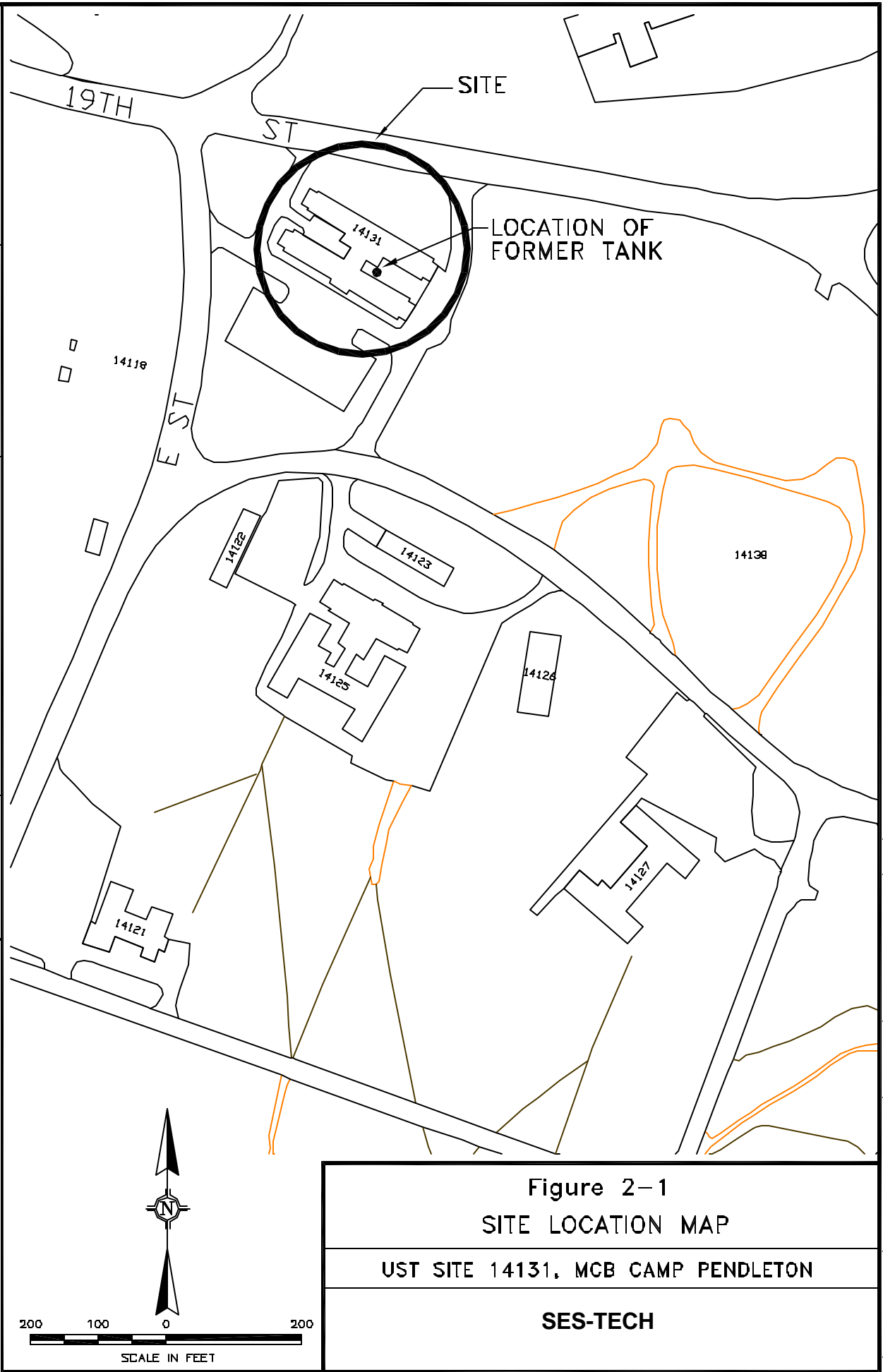
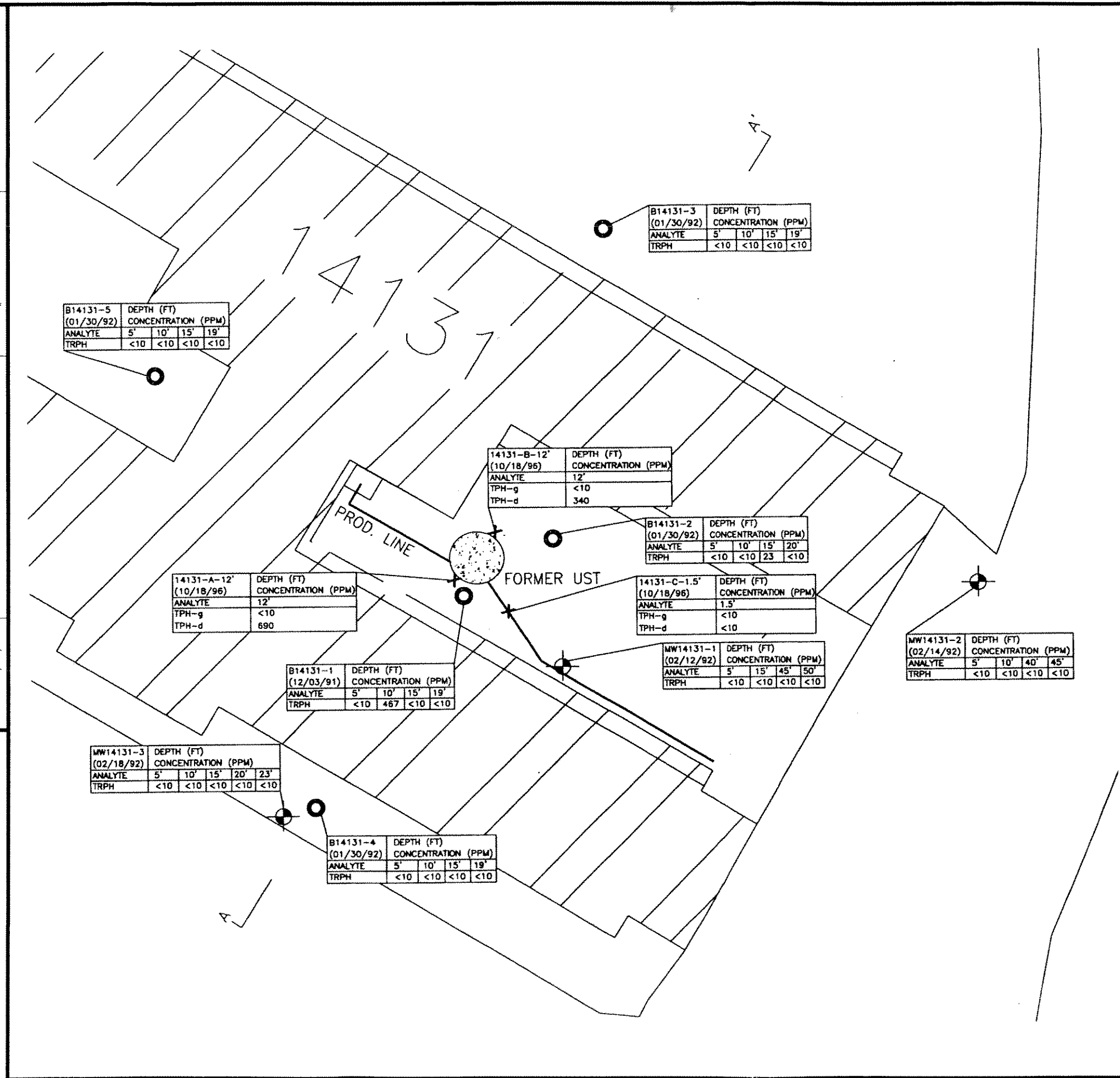


Figure 2-1
SITE LOCATION MAP
UST SITE 14131, MCB CAMP PENDLETON
SES-TECH



LEGEND

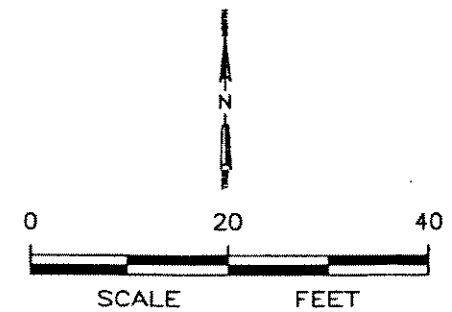
- X 14131-C-1.5' UST REMOVAL SOIL SAMPLE (1996)
- 14131-3 GROUNDWATER MONITORING WELL (JACOBS, 1992)
- B14131-5 SOIL BORING (JACOBS, 1992)

BORING ID	DEPTH (FT)
SAMPLE DATE	CONCENTRATION (PPM)
ANALYTE	5'
TRPH	<10

SOIL SAMPLE DEPTH AND ANAYTICAL RESULTS in milligrams per kilogram

ABBREVIATIONS:

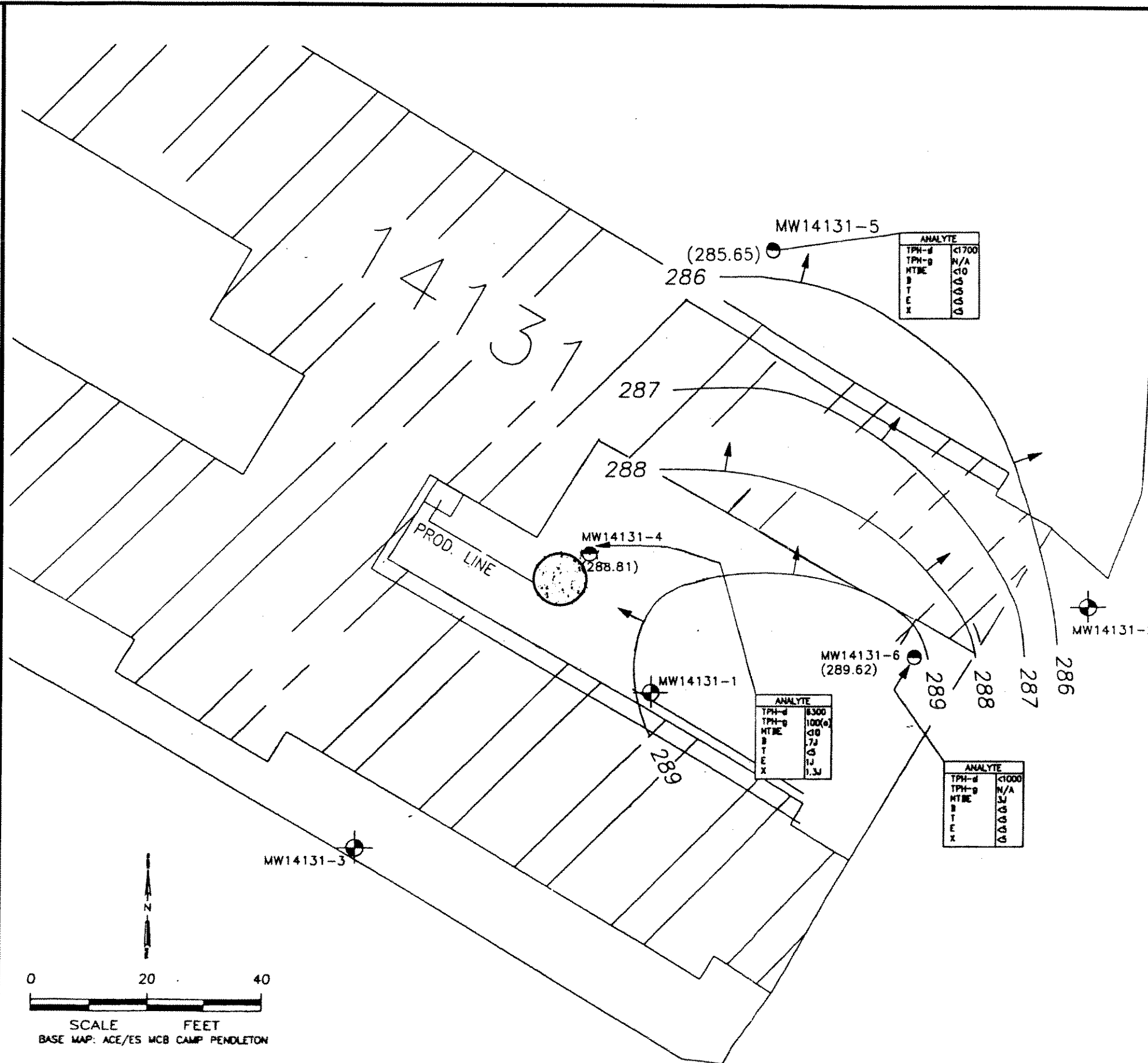
- TRPH TOTAL RECOVERABLE PETROLEUM HYDROCARBONS
- TPH-d DIESEL
- TPH-g GASOLINE



BASE MAP: ACE/ES MCB CAMP PENDLETON

Figure 2-2
HISTORICAL SOIL SAMPLE RESULTS FROM INITIAL
SITE ASSESSEMENT (JACOBS, 1992) AND TANK
REMOVAL (1996) ACTIVITIES
UST SITE 14131, MCB CAMP PENDLETON

SES-TECH



LEGEND

- MW14131-1 1992 MONITORING WELL (JACOBS)
- MW14131-2 1998 MONITORING WELL (SOTA)
- (289.62) GROUNDWATER ELEVATION 12/1/98 OR 12/2/98
- 289 GROUNDWATER TABLE CONTOUR WITH ARROWS INDICATING GROUNDWATER FLOW DIRECTION
- ANALYTE
TPH-d
TPH-g
MTBE
B
T
E
X
- GROUNDWATER SAMPLE ANALYTICAL RESULTS (IN MICROGRAMS PER LITER)

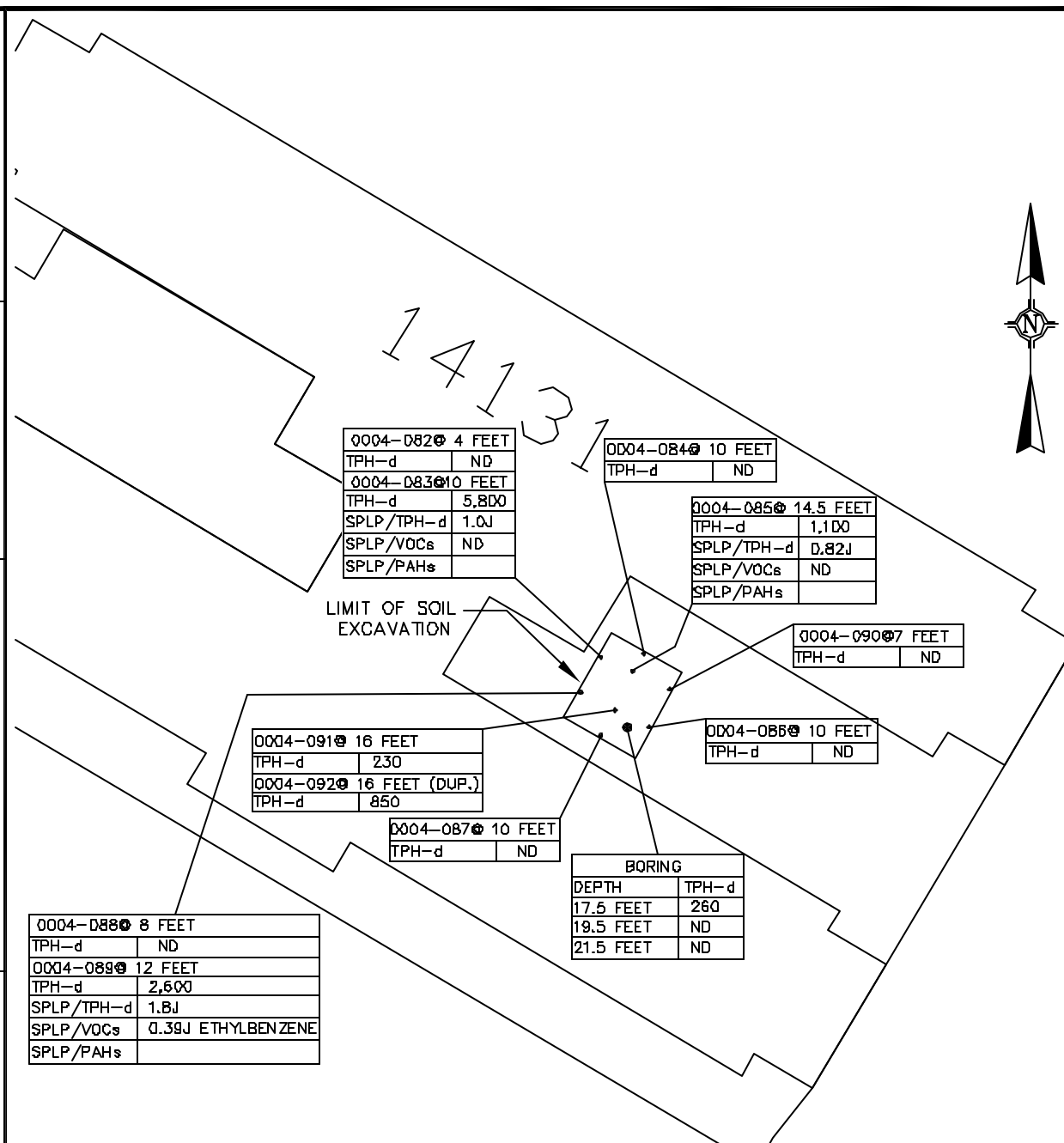
ABBREVIATIONS:

- TRPH TOTAL RECOVERABLE PETROLEUM HYDROCARBONS
- TPH-d DIESEL µg/L
- TPH-g GASOLINE µg/L
- B BENZENE µg/L
- T TOLUENE µg/L
- E ETHYLBENZENE µg/L
- X XYLENES µg/L
- J ESTIMATED VALUE, REPORTED BETWEEN PQL AND MDL
- (a) NOT A TYPICAL GASOLINE PATTERN
- N/A NOT ANALYZED
- µg/L MICROGRAMS PER LITER
- PQL PRACTICAL QUANTITATION LIMIT
- MDL METHOD DETECTION LIMIT

Figure 2-4
HISTORICAL GROUNDWATER SAMPLE RESULTS
FROM ADDITIONAL SITE INVESTIGATION
(SOTA, 2001)
UST SITE 14131, MCB CAMP PENDLETON

SES-TECH

DRAWN BY: MD	CHECKED BY: MC	APPROVED BY: MC	DCN: SES-TECH-06-0059	DRAWING NO: 06005925.DWG
DATE: 02/15/06	REV: REVISION 0		CTO: #0004	



LEGEND

- CONFIRMATION SOIL SAMPLE
 - SOIL BORING
- TPH-d TOTAL PETROLEUM HYDROCARBONS AS DIESEL (mg/kg)
 SPLP SYNTHETIC PRECIPITATION LEACHING PROCEDURE
 VOCs VOLATILE ORGANIC COMPOUNDS
 PAHs POLYNUCLEAR AROMATIC HYDROCARBONS
 mg/kg MILLIGRAMS PER KILOGRAM
 mg/L MILLIGRAMS PER LITER
 µg/L MICROGRAMS PER LITER
 J ESTIMATED VALUE
 DUP. DUPLICATE SAMPLE

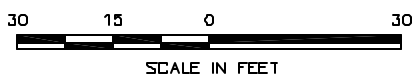
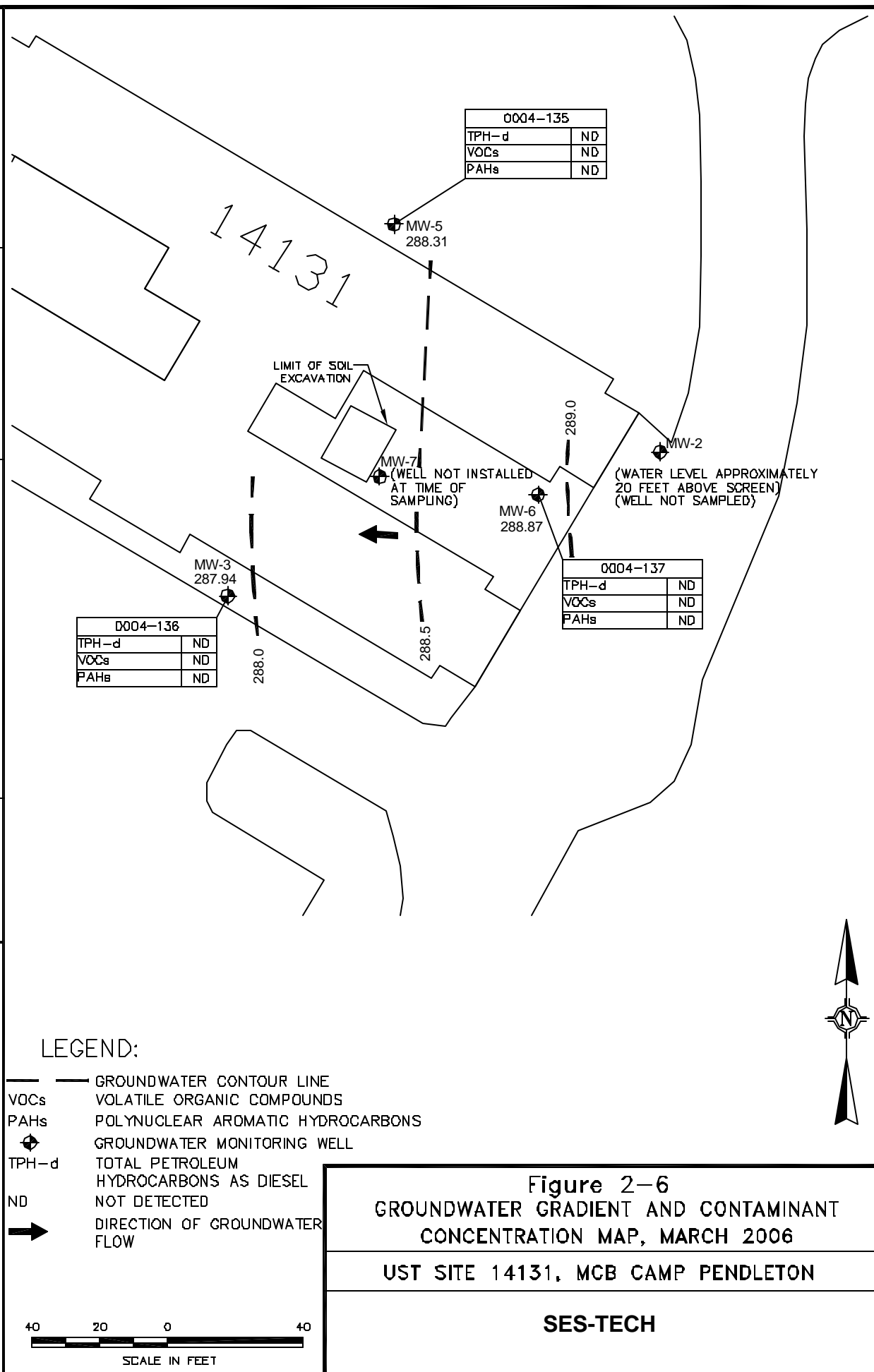


Figure 2-5
 SOIL BORING AND SOIL EXCAVATION
 CONFIRMATION SOIL SAMPLE RESULTS

UST SITE 14131, MCB CAMP PENDLETON

SES-TECH

DRAWN BY: MD	CHECKED BY: MC	APPROVED BY: MC	DCN: SES-TECH-06-0059	DRAWING NO: 06005926.DWG
DATE: 04/28/06	REV: REVISION 0		CTO: #0004	



APPENDIX A

WELL PERMIT DOCUMENTATION



TETRA TECH EC, INC.

February 10, 2006

Monitoring Well Permit Clerk
Site Assessment and Mitigation Program
County of San Diego, Department of Environmental Health
P.O. Box 129261
San Diego, CA 92112-9261

Subject: **Well Destruction Permit Protocol**
UST Sites 14137, 14131, and 1441, MCB Camp Pendleton

Reference: Permit Number LMON103667, January 6, 2006

Well Permit Clerk:

Tetra Tech EC is submitting this letter in fulfillment of the conditions of boring permit number LMON 103667 issued on January 6, 2006, for work at the following project:

Property Owner: United States Marine Corps
Site Address: Building 22165, MCB Camp Pendleton, California 92055
Contact Person: Mr. Chet Storrs
Assistant Chief of Staff, Environmental Security

On January 27 & 30, 2006, Tetra Tech EC observed the destruction of five 4-inch diameter groundwater monitoring wells, one at Site 14137, one at Site 14131, and three at Site 1441 (A.P.N. #101-520-14-00). The following is a summary of work conducted, including a description of the destruction method, and the type and volume of backfill materials used.

At each of the five wells, the well box was removed before overdrilling began. An 8-inch hollow stem auger was then used to drill the entire depth of each well, with the cuttings being drummed and sent off-site for disposal. Once the wells were overdrilled, the well casings were removed and backfilling began. The approximate volumes of each borehole and the backfill material (in cubic feet) are as follows:

Site 14137

MW4:

Volume of borehole to 20 feet: 6.9 cubic feet (ft³)

Volume of backfill: 6 ft³ bentonite grout + 1 ft³ hydrated bentonite chips on top = 7 ft³ backfill



1940 E. Deere Avenue, Suite 200, Santa Ana, CA 92705
Tel 949.756.7500 Fax 949.756.7560
www.tteci.com



TETRA TECH EC, INC.

Site 14131

MW4

Volume of borehole to 15 feet: 5.2 ft³

Volume of backfill: 4.5 ft³ bentonite grout + 1 ft³ hydrated bentonite chips on top = 5.5 ft³ backfill

Site 1441

During the destruction of the wells at Site 1441, very difficult drilling conditions were encountered. The predominant lithology at the site consists of decomposed granite (bedrock). Due to these conditions, the original boreholes were installed using an air-rotary drilling method, and while attempting to overdrill using a hollow-stem auger rig with an 8-inch auger, refusal was met at an approximate depth of 10 feet. The boreholes were therefore overdrilled to depth using a 6-inch auger.

MW1:

Volume of borehole to 38 feet: 8.9 ft³

Volume of backfill: 8 ft³ bentonite grout + 1 ft³ hydrated bentonite chips on top = 9 ft³ backfill

MW1a:

Volume of borehole to 15 feet: 4.5 ft³

Volume of backfill: 4 ft³ bentonite grout + 1 ft³ hydrated bentonite chips on top = 5 ft³ backfill

MW2:

Volume of borehole to 30 feet: 7.4 ft³

Volume of backfill: 6.5 ft³ bentonite grout + 1 ft³ hydrated bentonite chips on top = 7.5 ft³ backfill

To summarize, the volume of backfill material placed in each borehole exceeded the calculated volume of that borehole, indicating the boreholes were adequately abandoned.

If you have any questions, please contact me at (949) 756-7526.

Sincerely,

Tetra Tech EC

Mark Cutler, P.G.
Project Manager



Attachments: Well Location Map
Copy of Permit



1940 E. Deere Avenue, Suite 200, Santa Ana, CA 92705
Tel 949 756.7500 Fax 949 756.7560
www.tetatech.com



PERMIT #LMON103667
A.P.N. #101-520-14-00
EST #H05939-266/267/306

**COUNTY OF SAN DIEGO
DEPARTMENT OF ENVIRONMENTAL HEALTH
LAND AND WATER QUALITY DIVISION
MONITORING WELL PROGRAM**

MONITORING WELL AND BORING CONSTRUCTION AND DESTRUCTION PERMIT

SITE NAME: BUILDINGS 14137, 14131, 1441

SITE ADDRESS: AREA 14, MARINE CORPS BASE, CAMP PENDLETON

PERMIT TO: **INSTALL 6 & DESTROY 5 GROUNDWATER MONITORING WELLS**

PERMIT APPROVAL DATE: JANUARY 6, 2006

PERMIT EXPIRES ON: MAY 6, 2006

RESPONSIBLE PARTY: U.S. MARINE CORPS, CAMP PENDLETON

PERMIT CONDITIONS:

1. Each of the monitoring wells must be constructed with a minimum annular seal of 5 feet and a maximum screened interval of 15 feet.
2. Contact the Regional Water Quality Control Board for their comments and concerns prior to commencing field activities.
3. Wells must have a minimum 3-foot concrete surface seal. The surface seal shall consist of concrete able to withstand the maximum anticipated load without cracking or deteriorating. The concrete should meet Class A specifications of a minimum 4000-pound compressive strength.
4. For the well destructions, all material within the original borehole, which includes the casing, filterpack and annular seal, must be removed. The borehole must be completely filled with an approved sealing material as specified in Department of Water Resources Bulletin 74-90.
5. All water and soil resulting from the activities covered by this permit must be managed, stored and disposed of as specified in the SAM Manual in Section 5, II, E- 4. (http://www.sdcountry.ca.gov/deh/lwq/sam/manual_guidelines.html). In addition, drill cuttings must be properly handled and disposed in compliance with the Stormwater Best Management Practices of the local jurisdiction.
6. Within 60 days of completing work, submit a well construction report, including all well and/or boring logs and laboratory data to the Well Permit Desk. This report must include all items required by the SAM Manual, Section 5, Pages 6 & 7.
7. This office must be given 48-hour notice of any drilling activity on this site and advanced notification of drilling cancellation. Please contact the Well Permit Desk at 338-2339.

APPROVED BY: _____

KEVIN HEATON

DATE: 01/06/2006

NOTIFIED: by email 1/6/06 msc
DEH-SAM-9075 (3/05)

LEGEND

UST REMOVAL SOIL SAMPLE
MW14131-C-1.5'

MW14131-1 PREVIOUS MONITORING WELL BY
JEG/IT (1992)

814131-4 PREVIOUS BORING BY JEG/IT (1992)

814131-7

BORING BY SOTA (1998)

MW14131-6

SOTA MONITORING WELL (1998)

1289.021

GROUNDWATER ELEVATION
12/1/98 OR 12/2/98

1"=289
GROUNDWATER TABLE CONTOUR, WITH
ARROWS INDICATING GROUNDWATER
FLOW DIRECTION

ANALYTE
TPH-d
TPH-g
MTBE
B
T
E
X

GROUNDWATER SAMPLE ANALYTICAL
RESULTS (IN MICROGRAMS PER
LITER (PPB))

ABBREVIATIONS:

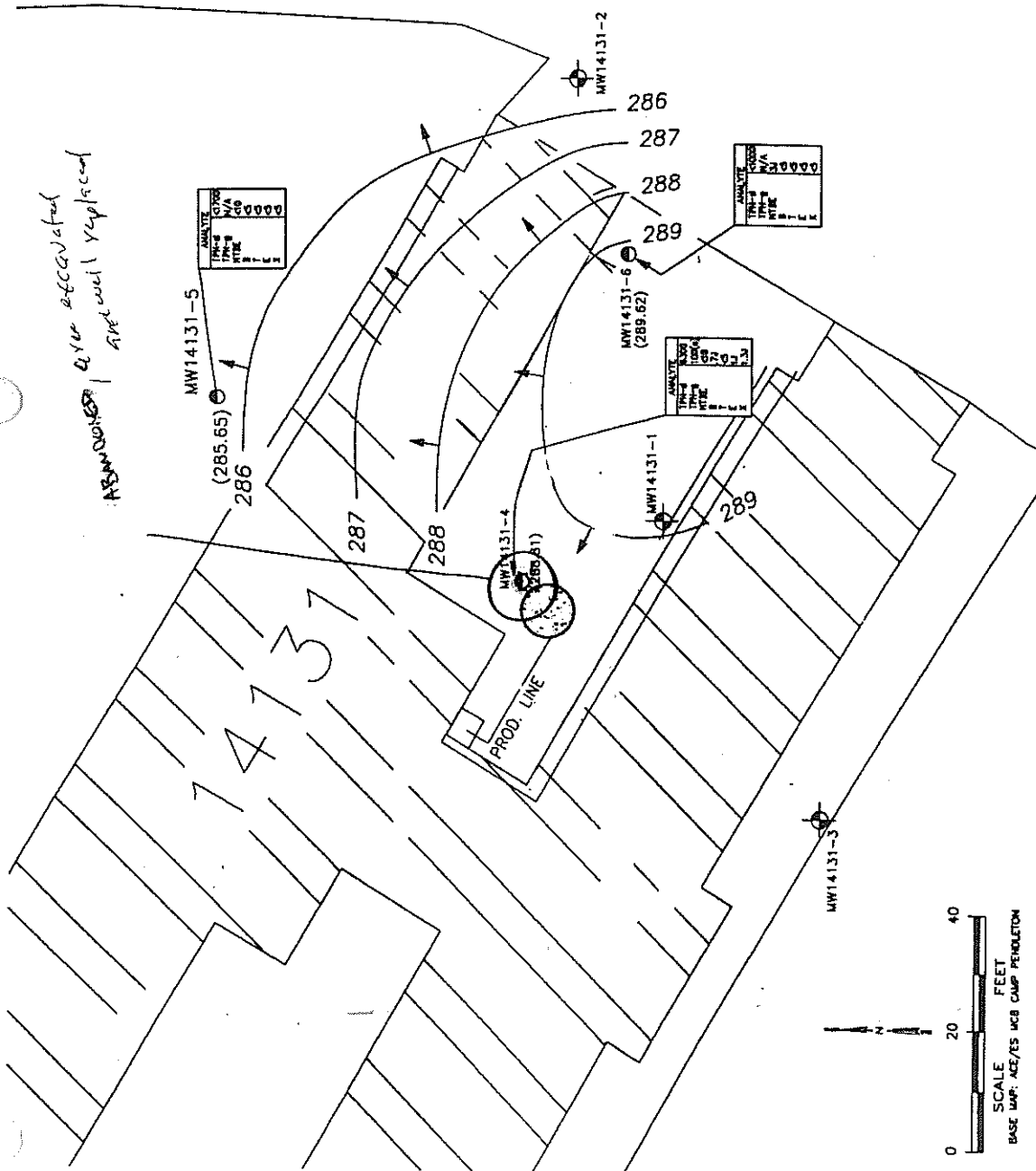
TPH-d : DIESEL ug/L
TPH-g : GASOLINE ug/L
MTBE : METHYL TERTIARY BUTYL
ETHER ug/L
B : BENZENE ug/L
T : TOLUENE ug/L
E : ETHYLBENZENE ug/L
X : XYLENES ug/L
J : ESTIMATED VALUE, REPORTED
BETWEEN POL AND MDL
ld : NOT A TYPICAL GASOLINE
PATTERN
N/A : NOT ANALYZED

Figure 2-4

GROUNDWATER SAMPLE RESULTS,
SOTA ENVIRONMENTAL (2001)

UST SITE 14131, MCB CAMP PENDLETON

SES-TECH



DRAWING NO. 05008924.DWG

DCN: SES-TECH-05-0089

APPROVED BY: MC

CHECKED BY: MC

DATE: 07/08/05

REV: REVISION D

CIO: #0004



TETRA TECH EC, INC.

April 27, 2006

Monitoring Well Permit Clerk
Site Assessment and Mitigation Program
County of San Diego, Department of Environmental Health
P.O. Box 129261
San Diego, CA 92112-9261

Subject: Monitoring Well Destruction and Installation Notification, UST Sites 14131, 14137, Marine Corps Base (MCB) Camp Pendleton, California

Reference: Permit No. LMON 103667

Well Permit Clerk:

Per your request, Tetra Tech EC is submitting the attached document in fulfillment of the conditions of monitoring well installation permit number LMON 103667. Documentation of the well destruction was previously submitted. The permit was issued on January 6, 2006, and the County was given 48 hours notice prior to commencement of the work of each phase of work. The work was conducted for the following UST Sites:

Property Owner: United States Marine Corps

**Site Address: UST Sites 14131, 14137
14 Area, MCB Camp Pendleton, California 92055**

**Contact Person: Mr. Chet Storrs
RCRA Division Head**

On February 21, 2006, 2 groundwater monitoring wells were installed in the 14 area of MCB Camp Pendleton; one at site 14131, and one at adjacent site 14137. The following volumes and materials were used in the construction of each of the wells:

Boring/ Well	Filter Pack #2/16 sand (cubic feet)	Transition Seal Bentonite chips (cubic feet)	Concrete Completion (cubic feet)
14131-MW7	3	1	1
14137-MW7	3	1	1



1940 E. Deere Avenue, Suite 200, Santa Ana, CA 92705
Tel 949.756.7500 Fax 949.756.7560
www.tteci.com

The attached documents include boring/monitoring well logs with well completion information, a signed and stamped Registered Geologist certification letter for the boring/monitoring well logs, and a well location map.

In addition, unfortunately the four (4) well installations at UST Site 1441 included on the permit have been postponed. A request for permit extension for these wells will soon follow.

If you have any questions regarding this matter, please contact the undersigned.

Sincerely,
Tetra Tech EC



Mark Cutler, RG
Senior Supervising Geologist

Attachments:

Copy of Permit

Location Map

Registered Geologist Certification Letter

Boring Logs



PERMIT #LMON103667
A.P.N. #101-520-14-00
EST #H05939-266/267/306

**COUNTY OF SAN DIEGO
DEPARTMENT OF ENVIRONMENTAL HEALTH
LAND AND WATER QUALITY DIVISION
MONITORING WELL PROGRAM**

MONITORING WELL AND BORING CONSTRUCTION AND DESTRUCTION PERMIT

SITE NAME: BUILDINGS 14137, 14131, 1441

SITE ADDRESS: AREA 14, MARINE CORPS BASE, CAMP PENDLETON

PERMIT TO: **INSTALL 6 & DESTROY 5 GROUNDWATER MONITORING WELLS**

PERMIT APPROVAL DATE: JANUARY 6, 2006

PERMIT EXPIRES ON: MAY 6, 2006

RESPONSIBLE PARTY: U.S. MARINE CORPS, CAMP PENDLETON

PERMIT CONDITIONS:

1. Each of the monitoring wells must be constructed with a minimum annular seal of 5 feet and a maximum screened interval of 15 feet.
2. Contact the Regional Water Quality Control Board for their comments and concerns prior to commencing field activities.
3. Wells must have a minimum 3-foot concrete surface seal. The surface seal shall consist of concrete able to withstand the maximum anticipated load without cracking or deteriorating. The concrete should meet Class A specifications of a minimum 4000-pound compressive strength.
4. For the well destructions, all material within the original borehole, which includes the casing, filterpack and annular seal, must be removed. The borehole must be completely filled with an approved sealing material as specified in Department of Water Resources Bulletin 74-90.
5. All water and soil resulting from the activities covered by this permit must be managed, stored and disposed of as specified in the SAM Manual in Section 5, II, E- 4. (http://www.sdcountry.ca.gov/deh/lwq/sam/manual_guidelines.html). In addition, drill cuttings must be properly handled and disposed in compliance with the Stormwater Best Management Practices of the local jurisdiction.
6. Within 60 days of completing work, submit a well construction report, including all well and/or boring logs and laboratory data to the Well Permit Desk. This report must include all items required by the SAM Manual, Section 5, Pages 6 & 7.
7. This office must be given 48-hour notice of any drilling activity on this site and advanced notification of drilling cancellation. Please contact the Well Permit Desk at 338-2339.

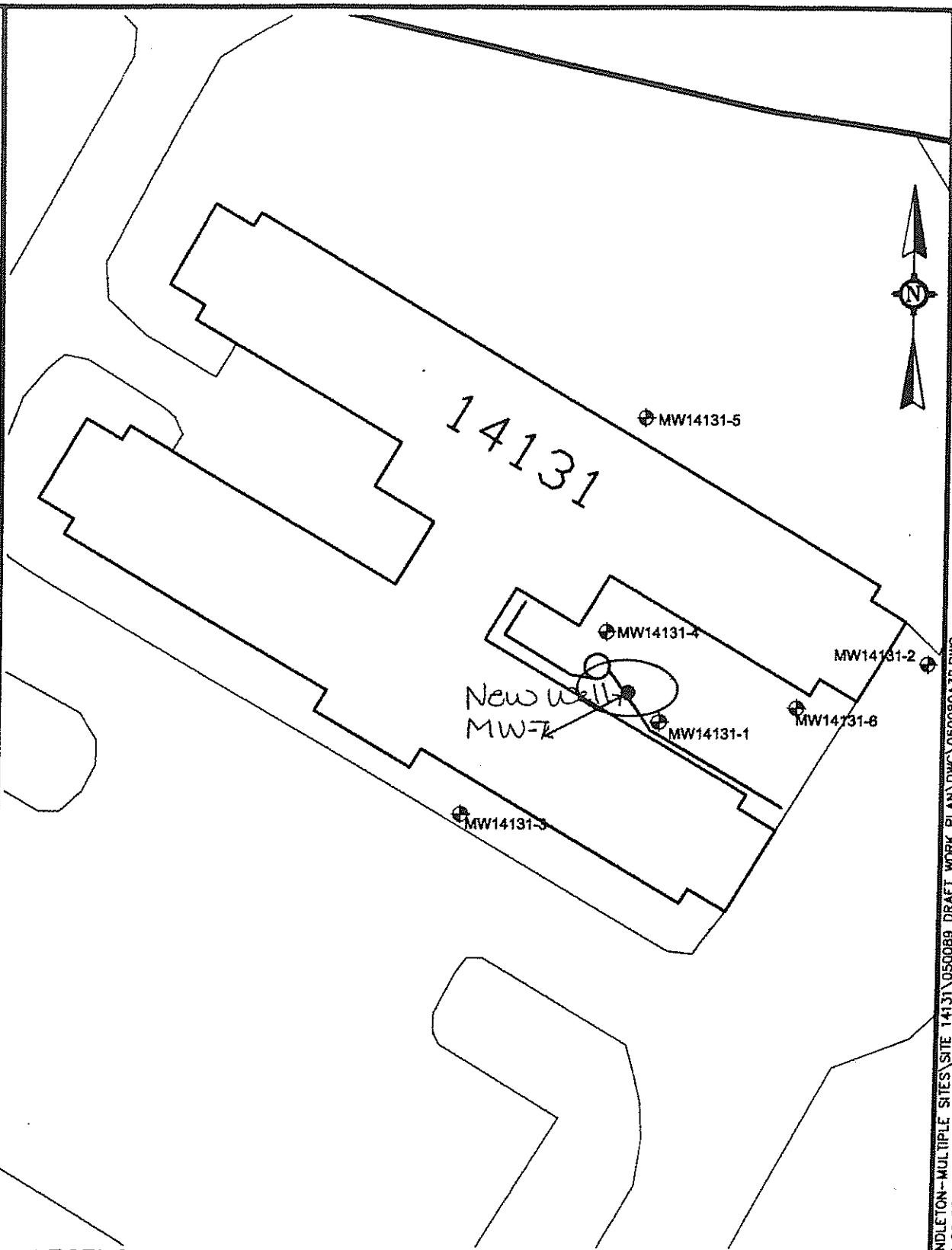
APPROVED BY: _____

KEVIN HEATON

DATE: 01/06/2006

NOTIFIED: *by email 1/6/06 msc*
DEH: SAM-9075 (3/05)

DRAWN BY: MD	CHECKED BY: MC	APPROVED BY: MC	DCN: SES-TECH-05-0089	DRAWING NO: 050089A32.DWG
DATE: 07/08/05	REV: REVISION 0		CTO: #0004	



LEGEND:

⊕ EXISTING WELL

○ New Well Location



**Figure A.3-2
GROUNDWATER MONITORING WELL MAP**

UST SITE 14131, MCB CAMP PENDLETON

SES-TECH

P:\2973-SESTECH\CTO-0004 PENDLETON-MULTIPLE SITES\SITE 14131\050089 DRAFT WORK PLAN\DWG\050089A32.DWG
PLOT/UPDATE: JUL 12 2005 10:09:25

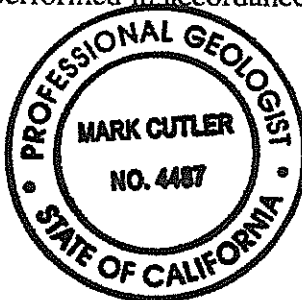
WELL INSTALLATION

Statement of Certification

I, Mark Cutler, certify that, to the best of my knowledge, the data and information presented in the boring and well completion logs listed below are accurate and complete. Field activities and documentation were performed in accordance with accepted practices and procedures.



Mark Cutler, CA PG # 4487



PERMIT NO. LMON 103667

MCB Camp Pendleton, Area 14, UST Site 14131

- Monitoring Well MW-7

MCB Camp Pendleton, Area 14, UST Site 14137

- Monitoring Well MW-7

TETRA TECH EC, INC.

LOG OF BORING MW-7 (Sheet 1 of 1)

Client: NAVFAC SW	Drilling Company: West Hazmat
Project: UST Site 14131	Drilling Method: Hollow-Stem Auger
Project Number: 2973.0004	Sampling Method: Split-Spoon
Location: Marine Corps Base Camp Pendleton	Borehole Diameter: 8 in.
Geologist: J. Sager	Northing: 2,060,713.53 Feet (NAD 83)
Date Started: February 21, 2006	Easting: 6,239,114.38 Feet (NAD 83)
Date Completed: February 21, 2006	Ground Surface Elevation: 296.41 Feet AMSL (NAVD 88)
Total Depth: 15.0 Feet bgs	Top of Casing Elevation: 295.99 Feet AMSL (NAVD 88)

Depth (ft. bgs)	Well/Boring Completion	Well/Boring Remarks	Blow Counts	Samples	Sample Number	PID Readings PPM	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation (ft.)
0		Flushed Mounted Well Vault							0 to 10 ft. SILTY SAND: 80% fine to coarse subrounded to subangular sand, 15% nonplastic fines, 5% plastic fines	295
1		Cement								
2		Bentonite Seal								
3		4" Schedule 40 PVC Riser					SM			
4		4" Schedule 40 PVC								
5		Factory-Slotted Screen								
6		0.010" Slot-Size								
7										
8										
9										
10										
11										
12										
13		Filter Pack #2/16 Sand					CL		10 to 15 ft. SANDY LEAN CLAY: 85% plastic fines, 15% fine sand, olive-green to gray, moist, low to medium plasticity, medium stiff	285
14										
15										
16										280

Notes: Reviewed By: M. Cutler, P.G.
 AMSL = above mean sea level
 bgs = below ground surface
 NA = not applicable
 PVC = Polyvinyl Chloride

PVC = polyvinyl chloride

APPENDIX B

**STOCKPILE WAIVER CERTIFICATE AND SOIL EXCAVATION NON-
HAZARDOUS MATERIALS HAULING MANIFESTS**

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION**

9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340
Attention: Land Discharge Unit

RWQCB Regulatory Program:

☐ LDU ☐ Dnd/SIC ☐ UST/AST/LOP County _____

I. Generator of Temporary Waste Pile

SECTION A: Temporary Waste Pile Waiver Certification

Generator Name: AC/S Environmental Security, MCB Camp Pendleton
 Mailing Address: Box 556003 Bldg. 2216B
Camp Pendleton SD CA 92055 760-725-9774 760-725-9774
 Contact: Chet Starrs Remediation Branch Manager

II. Present Status of Temporary Waste Pile

Site Location: Building 1441, 14 Area
 Property Owner Name: U.S. Marine Corps
Camp Pendleton SD CA 92055 101-520-14-00
 RWQCB File No.: 9UT3424 LOP Case No.: _____ County (Ch. 160): 160 Method of Containment: Berm + Plastic Sheeting

Waste Type

Contaminant Type/Source:
☐ Gasoline
☒ Oil
☐ Other Petrol. Hydrocarbons
☐ Impacted Dredge Spoils
☐ Other Impacted Soils

Contaminant/Constituent Concentrations

Diesel (mg/kg)									
Mass	Mass + 50% CL	Mass	Mass + 50% CL	Mass	Mass + 50% CL	Mass	Mass + 50% CL	Mass	Mass + 50% CL
294.0	356.0								

III. Waste Pile Site Information

Site Conditions Met:
☒ Ground Water Separation
☒ Surface Water Separation
☒ Flood Plain Protection
☒ Cover of Waste Pile
☒ Precipitation/Drainage Control

Discharge/Property Owner:
U.S. Marine Corps
Building 1441, 14 Area
Camp Pendleton SD CA 92055
 Contact: Chet Starrs 760-725-9774
 Date: 01/31/06

Property Owner Acknowledgment:
 I hereby acknowledge receipt of the notice, and acknowledge that I have reviewed any associated reports. By signing this form I acknowledge that the Generator of this waste has certified that all the conditions for the waiver from Waste Discharge Requirements (WDRs) for discharge of specified waste indicated in Section II (above) have been met.

Print Name: C. Starrs Title: Rem. Branch Head
 Signature: [Signature] Date: 13 Feb 06

IV. Generator Certification

I hereby certify that the information provided regarding soil characterization is a complete and accurate representation of the subject soil, and that the soil is not hazardous waste as defined by the California Code of Regulations, Title 22, and by the United States Environmental Protection Agency (Code of Federal Regulations, Title 40), and that all conditions for the waiver from WDRs for discharge of specified waste indicated in Section II (above) have been met.

Print Name: C. Starrs Title: Rem. Branch Head
 Signature: [Signature] Date: 13 Feb 06

California Regional Water Quality Control Board, San Diego Region

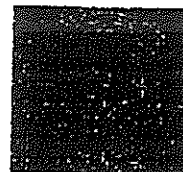
Version: 7/3/02

MAIL CERTIFICATION FORMS TO:

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Attention: Land Discharge Unit Supervisor



V. Final Waste Disposal Information

SECTION B: Temporary Waste Pile Waiver Certification

Final Disposition of Waste <input checked="" type="checkbox"/> Offsite/Landfill disposal <input type="checkbox"/> On-site reuse/disposal <input type="checkbox"/> Off-site reuse/disposal <input type="checkbox"/> Other	Discharger/Property Owner			
	Property Owner/Discharger: U.S. Marine Corps (UST Site 144)			
	Mailing Address: Box 555008, Building 22165			
	City: Camp Pendleton	County: San Diego	State: Ca	Zip: 92055
	Contact Name: Chet Storrs		Phone: 760-725-9774	
	Date(s) Waste Pile(s) Disposed:		Disposal Location(s): Candelaria Environmental 4001, Candelaria Lane, Anza, Ca 92539	

Final Disposal Certification

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Print Name: C Storrs
 Signature: [Signature]

Title: Res Branch Head
 Date: 13 Feb 06

For Agency Use Only		
RWQCB Regulatory Program:		
<input type="checkbox"/> LDU	<input type="checkbox"/> DoD/SLIC	<input type="checkbox"/> UST/AGT/LOP County _____

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

NC 43067

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 ARKA)
ADDRESS: P.O. BOX 555008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-06

WASTE DESCRIPTION NON-HAZ SOIL GENERATING PROCESS UST LEAK
COMPONENTS OF WASTE (PPM) COMPONENTS OF WASTE (PPM)
DIESEL-IMPACTED SOIL UST SITES: 14131/14137/1441

PROPERTIES: SOLID YES
HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: _____ DATE: _____
Signature / Print or Type Full Name

HAULER

COMPANY NAME WEST COAST PHONE NO. (619) 443-4200
ADDRESS PO Box 1521 SERVICE ORDER NO. _____
CITY, STATE, ZIP CAMP PENDLETON PICK UP DATE 2-13-06
TRUCK TYPE: DUMP ☒ ROLL OFF ☐ OTHER ☐
TRUCK LIC. # CP77598 TRUCK ID # 717-44
DRIVER NAME _____ TRAILER LIC. # HL19158
DRIVER SIGNATURE _____ TRAILER ID # 717-44T

PROCESSOR

TIME LEFT JOB 7:15 LOAD # 1
JOB SITE REPRESENTATIVE Chris C. [Signature]
Name Signature

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24^{hr} Emergency (619) 696-6207

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

43068

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
ADDRESS: P.O. BOX 555008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-06

WASTE DESCRIPTION NON-HAZ SOIL GENERATING PROCESS UST LEAK
COMPONENTS OF WASTE (PPM) COMPONENTS OF WASTE (PPM)
DIESEL-IMPACTED SOIL UST SITES: 14131/14137/1441

PROPERTIES: SOLID YES
HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: [Signature] DATE: 11/17/00
Signature / Print or Type Full Name

HAULER

COMPANY NAME WCRS PHONE NO. 619-461-3907
ADDRESS 14136 SERVICE ORDER NO.
CITY, STATE, ZIP Camp Pendleton, CA 92055 PICK UP DATE 2-13-00
TRUCK TYPE: DUMP ROLL OFF OTHER
TRUCK LIC. # CP74529 TRUCK ID # 1202
DRIVER NAME [Signature] TRAILER LIC. # 4664581
DRIVER SIGNATURE [Signature] TRAILER ID # 1202

PROCESSOR

TIME LEFT JOB 7:20 LOAD # 2
JOB SITE REPRESENTATIVE [Signature]
Name Signature

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24^{hr} Emergency (619) 696-6207

CANDELARIA ENVIRONMENTAL

43069

BIOTREATMENT FACILITY

NON-HAZARDOUS MATERIALS HAULING MANIFEST

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
 ADDRESS: P.O. BOX 555008 PHONE NO. (760) 725-9774
 CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-08

WASTE DESCRIPTION NON-HAZ SOIL GENERATING PROCESS UST LEAK
 COMPONENTS OF WASTE (PPM) COMPONENTS OF WASTE (PPM)
DIESEL-IMPACTED SOIL UST SITES: 14131/14137/1441

PROPERTIES: SOLID YES
 HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: [Signature] DATE: 12 Feb 06
 Signature / Print or Type Full Name

HAULER

COMPANY NAME W.C.R.S. PHONE NO. 415 511 1301
 ADDRESS PO BOX 1501 SERVICE ORDER NO. _____
 CITY, STATE, ZIP LAKEVIEW CA PICK UP DATE 1-13-06
 TRUCK TYPE: DUMP ✓ ROLL OFF _____ OTHER _____
 TRUCK LIC. # C2 744 98 TRUCK ID # 140-16
 DRIVER NAME Bill Berry TRAILER LIC. # HT14040
 DRIVER SIGNATURE [Signature] TRAILER ID # 906-16T

PROCESSOR

TIME LEFT JOB 0730 LOAD # 3
 JOB SITE REPRESENTATIVE _____
 Name _____ Signature [Signature]

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
 4001 Candelaria Lane
 Anza, CA 92539
 (951) 763-0129

Main office:
 Phone: (619) 696-6207
 FAX (619) 696-5117
 24^{hr} Emergency (619) 696-6207

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

NO 43070

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
ADDRESS: P.O. BOX 555008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-06

WASTE DESCRIPTION NON-HAZ SOIL GENERATING PROCESS UST LEAK
COMPONENTS OF WASTE (PPM) DIESEL-IMPACTED SOIL COMPONENTS OF WASTE (PPM)
UST SITES: 14131/14137/1441

PROPERTIES: SOLID YES
HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: [Signature] DATE: 13 Feb 06
Signature / Print or Type Full Name

HAULER

COMPANY NAME WEST COAST PLS PHONE NO. 619 661 3708
ADDRESS PO BOX 531 SERVICE ORDER NO.
CITY, STATE, ZIP PO BOX 531 PICK UP DATE 2-13-06
TRUCK TYPE: DUMP X ROLL OFF OTHER

TRUCK LIC. # 5P 46008 TRUCK ID # 717-7

DRIVER NAME ANGIE DOMINGUEZ TRAILER LIC. # 6T 65756

DRIVER SIGNATURE [Signature] TRAILER ID # 717-7

TIME LEFT JOB 07 LOAD # 4

JOB SITE REPRESENTATIVE [Signature]
Name Signature

PROCESSOR

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24^{hr} Emergency (619) 696-6207

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

112

43071

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
ADDRESS: P.O. BOX 555008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-06

WASTE DESCRIPTION NON-HAZ SOIL GENERATING PROCESS UST LEAK
COMPONENTS OF WASTE (PPM) _____ COMPONENTS OF WASTE (PPM) _____

DIESEL-IMPACTED SOIL

UST SITES: 14131/14137/1441

PROPERTIES: SOLID YES

HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: [Signature] DATE: 10/1/01
Signature / Print or Type Full Name

HAULER

COMPANY NAME _____ PHONE NO. _____
ADDRESS _____ SERVICE ORDER NO. _____
CITY, STATE, ZIP _____ PICK UP DATE _____
TRUCK TYPE: DUMP _____ ROLL OFF _____ OTHER _____

TRUCK LIC. # 111111 TRUCK ID # _____

DRIVER NAME _____ TRAILER LIC. # _____

DRIVER SIGNATURE _____ TRAILER ID # _____

PROCESSOR

TIME LEFT JOB 12:15 LOAD # _____

JOB SITE REPRESENTATIVE _____
Name Signature

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24 hr Emergency (619) 696-6207

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

43072

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
ADDRESS: P.O. BOX 553008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-06

WASTE DESCRIPTION NON-HAZ SOIL GENERATING PROCESS UST LEAK
COMPONENTS OF WASTE (PPM) _____ COMPONENTS OF WASTE (PPM) _____
DIESEL-IMPACTED SOIL UST SITES: 14131/14137/1441

PROPERTIES: SOLID YES
HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-
HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE
APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: _____ DATE: 1/3/06
Signature / Print or Type Full Name

HAULER

COMPANY NAME Wendy Bryant PHONE NO. (951) 763-0129
ADDRESS 4001 Candelaria Lane SERVICE ORDER NO. _____
CITY, STATE, ZIP Anza, CA 92539 PICK UP DATE 2/13/06
TRUCK TYPE: DUMP ROLL OFF OTHER
TRUCK LIC. # 9H153 TRUCK ID # 1001
DRIVER NAME Wendy Bryant TRAILER LIC. # 47231
DRIVER SIGNATURE [Signature] TRAILER ID #

PROCESSOR

TIME LEFT JOB 0755 LOAD # 6
JOB SITE REPRESENTATIVE Wendy Bryant [Signature]
Name Signature

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24^{hr} Emergency (619) 696-6207

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

NO 43073

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
ADDRESS: P.O. BOX 555008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-06

WASTE DESCRIPTION NON-HAZ SOIL GENERATING PROCESS UST LEAK
COMPONENTS OF WASTE (PPM) COMPONENTS OF WASTE (PPM)
DIESEL-IMPACTED SOIL UST SITES 14131/14137/1441

PROPERTIES: SOLID YES
HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: [Signature] DATE: 13 FEB 06
Signature / Print or Type Full Name

HAULER

COMPANY NAME: Winters Trucking PHONE NO. 619 518-7086
ADDRESS: 790 Arter Ave SERVICE ORDER NO. _____
CITY, STATE, ZIP: EL CAJON CA PICK UP DATE: 2/13/06
TRUCK TYPE: DUMP X ROLL OFF _____ OTHER X
TRUCK LIC. # 7M173028 TRUCK ID # JT-1
DRIVER NAME: Richard Jones TRAILER LIC. # 4FC 9684
DRIVER SIGNATURE: [Signature] TRAILER ID # JT-15

PROCESSOR

TIME LEFT JOB: 0835 LOAD # 7
JOB SITE REPRESENTATIVE: Wmmy Bryant
Name Signature

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24^{hr} Emergency (619) 696-6207

APPENDIX C

**LABORATORY ANALYTICAL REPORTS FOR
EXCAVATION CONFIRMATION SOIL SAMPLES AND
EXCAVATION BACKFILL MATERIAL**

CHAIN-OF-CUSTODY RECORD

PROJECT NAME		PURCHASE ORDER NO.		ANALYSES REQUIRED										LABORATORY NAME		Project Information Section Do not submit to Laboratory					
PROJECT LOCATION		PROJECT NO.												LABORATORY ID (FOR LABORATORY)		LOCATION		DEPTH		QC	
SAMPLER NAME		SAMPLER SIGNATURE		NO. OF CONTAINER		LEVEL		TYP		TAT											
PROJECT CONTACT		AIRBILL NUMBER		TIME COLLECTED		DATE COLLECTED															
Camo Pendleton		TBD well		2		3		4		T		A		T							
OST Site 14131		2973.0040		2		X		X		X		X		X		X		X		X	
Wendy Bryant		2973.0040		2		X		X		X		X		X		X		X		X	
Nick Weinberger		2973.0040		2		X		X		X		X		X		X		X		X	
0004-082		27106		0832		27106		0832		0832		0832		0832		0832		0832		0832	
0004-083		27106		0837		27106		0837		0837		0837		0837		0837		0837		0837	
0004-084		27106		0846		27106		0846		0846		0846		0846		0846		0846		0846	
0004-085		27106		0858		27106		0858		0858		0858		0858		0858		0858		0858	
0004-086		27106		0956		27106		0956		0956		0956		0956		0956		0956		0956	
0004-087		27106		1007		27106		1007		1007		1007		1007		1007		1007		1007	
0004-088		27106		1032		27106		1032		1032		1032		1032		1032		1032		1032	
0004-089		27106		1046		27106		1046		1046		1046		1046		1046		1046		1046	
0004-090		27106		1108		27106		1108		1108		1108		1108		1108		1108		1108	
0004-091		27106		1132		27106		1132		1132		1132		1132		1132		1132		1132	
0004-092		27106		1138		27106		1138		1138		1138		1138		1138		1138		1138	
RELINQUISHED BY (Signature)		DATE		TIME		DATE		TIME		DATE		TIME		DATE		TIME		DATE		TIME	
TTC		11/1/05		1510		11/1/05		1510		11/1/05		1510		11/1/05		1510		11/1/05		1510	
COMPANY		TTC		TTC		TTC		TTC		TTC		TTC		TTC		TTC		TTC		TTC	
RELINQUISHED BY (Signature)		DATE		TIME		DATE		TIME		DATE		TIME		DATE		TIME		DATE		TIME	
TTC		11/1/05		1510		11/1/05		1510		11/1/05		1510		11/1/05		1510		11/1/05		1510	
COMPANY		TTC		TTC		TTC		TTC		TTC		TTC		TTC		TTC		TTC		TTC	
RELINQUISHED BY (Signature)		DATE		TIME		DATE		TIME		DATE		TIME		DATE		TIME		DATE		TIME	
TTC		11/1/05		1510		11/1/05		1510		11/1/05		1510		11/1/05		1510		11/1/05		1510	
COMPANY		TTC		TTC		TTC		TTC		TTC		TTC		TTC		TTC		TTC		TTC	
RELINQUISHED BY (Signature)		DATE		TIME		DATE		TIME		DATE		TIME		DATE		TIME		DATE		TIME	
TTC		11/1/05		1510		11/1/05		1510		11/1/05		1510		11/1/05		1510		11/1/05		1510	
COMPANY		TTC		TTC		TTC		TTC		TTC		TTC		TTC		TTC		TTC		TTC	

COPY

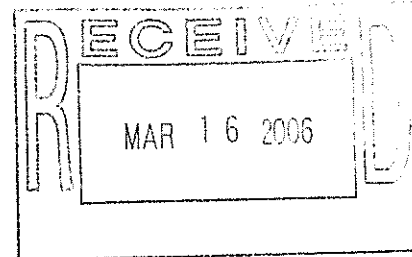


TABLE OF CONTENTS

CLIENT: **SES-TECH**

PROJECT: **CAMP PENDLETON, UST SITE 14131**

SDG: **06B050**

SECTION		PAGE
Cover Letter, COC/Sample Receipt Form		1000 – 1003
GC/MS-VOA	**	2000 –
GC/MS-SVOA	**	3000 –
GC-VOA	**	4000 –
GC-SVOA	METHOD 3550B/8015B	5000 – 5050
HPLC	**	6000 –
METALS	**	7000 –
WET	**	8000 –
OTHERS	**	9000 –

** - Not Requested



LABORATORIES, INC.

1835 W. 205th Street

Torrance, CA 90501

Tel: (310) 618-8889

Fax: (310) 618-0818

Date: 02-13-2006

EMAX Batch No.: 068050

Attn: Nick Weinberger

SES-TECH

1940 E. Deere Avenue, Suite 200

Santa Ana CA 92705

Subject: Laboratory Report

Project: Camp Pendleton, UST Site 14131

Enclosed is the Laboratory report for samples received on 02/07/06.
The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
0004-082	8050-01	02/07/06	SOIL	TPH DIESEL
0004-083	8050-02	02/07/06	SOIL	TPH DIESEL
0004-084	8050-03	02/07/06	SOIL	TPH DIESEL
0004-085	8050-04	02/07/06	SOIL	TPH DIESEL
0004-086	8050-05	02/07/06	SOIL	TPH DIESEL
0004-087	8050-06	02/07/06	SOIL	TPH DIESEL
0004-088	8050-07	02/07/06	SOIL	TPH DIESEL
0004-089	8050-08	02/07/06	SOIL	TPH DIESEL
0004-090	8050-09	02/07/06	SOIL	TPH DIESEL
0004-091	8050-10	02/07/06	SOIL	TPH DIESEL
0004-092	8050-11	02/07/06	SOIL	TPH DIESEL
0004-086MS	8050-05M	02/07/06	SOIL	TPH DIESEL
0004-086MSD	8050-05S	02/07/06	SOIL	TPH DIESEL

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,

Kam Y. Pang, Ph.D.
Laboratory Director

NUMBER 04969

CHAIN-OF-CUSTODY RECORD

06B050



PROJECT NAME		PURCHASE ORDER NO.		ANALYSES REQUIRED		LABORATORY NAME	
PROJECT LOCATION		PROJECT NO.					
SAMPLER NAME		SAMPLER SIGNATURE				LABORATORY ID (FOR LABORATORY)	
PROJECT CONTACT		PROJECT NUMBER				COMMENTS	
SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL	TYPE	TA	
				3	4		
1 0004-082	2/10/06	0832	2	X			
2 0004-083	2/10/06	0837	2	X			
3 0004-084	2/10/06	0846	2	X			
4 0004-085	2/10/06	0858	2	X			
5 0004-086	2/10/06	0956	4	X			include this in SID
6 0004-087	2/10/06	1007	2	X			
7 0004-088	2/10/06	1032	2	X			
8 0004-089	2/10/06	1040	2	X			
9 0004-090	2/10/06	1108	2	X			
10 0004-091	2/10/06	1132	2	X			
11 0004-092	2/10/06	1138	2	X			
LABORATORY INSTRUCTIONS/COMMENTS							
add samples for possible SLP extraction							
COMPOSITE DESCRIPTION							
SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)							
TEMPERATURE: 3.4°C SAMPLE CONDITION: <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> BROKEN							
COOLER SEAL: <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> BROKEN							
RELINQUISHED BY (Signature)		RECEIVED BY (Signature)					
DATE		DATE					
TIME		TIME					
COMPANY		COMPANY					
RELINQUISHED BY (Signature)		RECEIVED BY (Signature)					
DATE		DATE					
TIME		TIME					
COMPANY		COMPANY					
RELINQUISHED BY (Signature)		RECEIVED BY (Signature)					
DATE		DATE					
TIME		TIME					
COMPANY		COMPANY					

Type of Delivery	Delivered By/Airbill	ECN	068050
<input type="checkbox"/> EMAX Courier		Recepient	JLVNA
<input checked="" type="checkbox"/> Client Delivery		Date	020706
<input type="checkbox"/> Third Party		Time	1500

COC Inspection		
<input checked="" type="checkbox"/> Client Name	<input type="checkbox"/> Sampler Name	<input type="checkbox"/> Sampling Date/Time/Location
<input checked="" type="checkbox"/> Address	<input checked="" type="checkbox"/> Courier Signature/Date/Time	<input checked="" type="checkbox"/> Analysis Required
<input checked="" type="checkbox"/> Client PM/FC	<input checked="" type="checkbox"/> TAT	<input checked="" type="checkbox"/> Matrix
<input type="checkbox"/> Tel #/Fax #	<input checked="" type="checkbox"/> Sample ID	<input type="checkbox"/> Preservative (If any)
Safety Issues	<input type="checkbox"/> None	<input type="checkbox"/> Superfund Site Samples
Comments:	<input type="checkbox"/> High Concentrations expected	
	<input type="checkbox"/> Rad Screening Required	

[illegible]

Sample Labeling _____
Date 020706

SRF _____
Date 2/7/06

PM 2:20
Date 2/7/06

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14131

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

SDG#: 06B050

5000

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG: 06B050

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Eleven (11) soil samples were received on 02/07/06 for Total Petroleum Hydrocarbons by Extraction analysis by Method 3550B/8015B in accordance with SW846 3RD Edition.

1. Holding Time

Analytical holding time was met. Extraction was performed and completed on 02/08/06.

2. Calibration

Initial calibration was seven points for Diesel. %RSDs were within 20%. Continuing calibrations were carried out at 12-hour intervals and all recoveries were within 85-115%.

3. Method Blank

Method blank was free of contamination at half of the reporting limit.

4. Surrogate Recovery

Surrogate recovery in sample B050-02 could not be evaluated due to dilution. All others met the QC criteria.

5. Lab Control Sample

Recovery was within QC limits.

6. Matrix Spike/Matrix Spike Duplicate

Sample B050-05 was spiked. Recoveries were within QC limits.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception. Sample results were quantitated from C10 to C24 using Diesel (C10-C24) calibration factor.

Samples B050-02, -04, -08, -10 and -11 displayed diesel-like fuel pattern.

LAB CHRONICLE
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14131
SDG NO. : 068050
Instrument ID : GCI050

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	SOIL									
				Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Prep. Data FN	Batch	Notes				
MBLK1S LCS1S	DSB021SB	1	NA	02/08/0612:20	02/08/0610:10	TB06064A	TB06062A	DSB021S	Method Blank				
	DSB021SL	1	NA	02/08/0613:03	02/08/0610:10	TB06065A	TB06062A	DSB021S	Lab Control Sample (LCS)				
0004-082	B050-01	1	11.6	02/08/0613:46	02/08/0610:10	TB06066A	TB06062A	DSB021S	Field Sample				
0004-083	B050-02T	10	13.3	02/09/0610:15	02/08/0610:10	TB06095A	TB06087A	DSB021S	Diluted Sample				
0004-084	B050-03	1	11.5	02/08/0614:28	02/08/0610:10	TB06067A	TB06062A	DSB021S	Field Sample				
0004-085	B050-04	1	20.1	02/08/0615:11	02/08/0610:10	TB06068A	TB06062A	DSB021S	Field Sample				
0004-086	B050-05	1	11.2	02/08/0615:54	02/08/0610:10	TB06069A	TB06062A	DSB021S	Field Sample				
0004-087	B050-06	1	11.3	02/08/0618:02	02/08/0610:10	TB06072A	TB06062A	DSB021S	Field Sample				
0004-088	B050-07	1	12.1	02/08/0618:44	02/08/0610:10	TB06073A	TB06062A	DSB021S	Field Sample				
0004-089	B050-08	1	18.3	02/08/0622:59	02/08/0610:10	TB06079A	TB06074A	DSB021S	Field Sample				
0004-090	B050-09	1	9.3	02/08/0620:52	02/08/0610:10	TB06076A	TB06074A	DSB021S	Field Sample				
0004-091	B050-10	1	15.9	02/08/0621:34	02/08/0610:10	TB06077A	TB06074A	DSB021S	Field Sample				
0004-092	B050-11	1	15.6	02/08/0623:41	02/08/0610:10	TB06080A	TB06074A	DSB021S	Field Sample				
0004-084MS	B050-05M	1	11.2	02/08/0616:36	02/08/0610:10	TB06070A	TB06062A	DSB021S	Matrix Spike Sample (MS)				
0004-084MSD	B050-05S	1	11.2	02/08/0617:19	02/08/0610:10	TB06071A	TB06062A	DSB021S	MS Duplicate (MSD)				

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 068050                      Date Extracted: 02/08/06 10:10
Sample ID   : 0004-082                    Date Analyzed: 02/08/06 13:46
Lab Samp ID : B050-01                     Dilution Factor: 1
Lab File ID : TB06066A                   Matrix       : SOIL
Ext Btch ID : DSB021S                    % Moisture    : 11.6
Calib. Ref. : TB06062A                   Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MOL (mg/kg)
DIESEL	ND	11	5.7

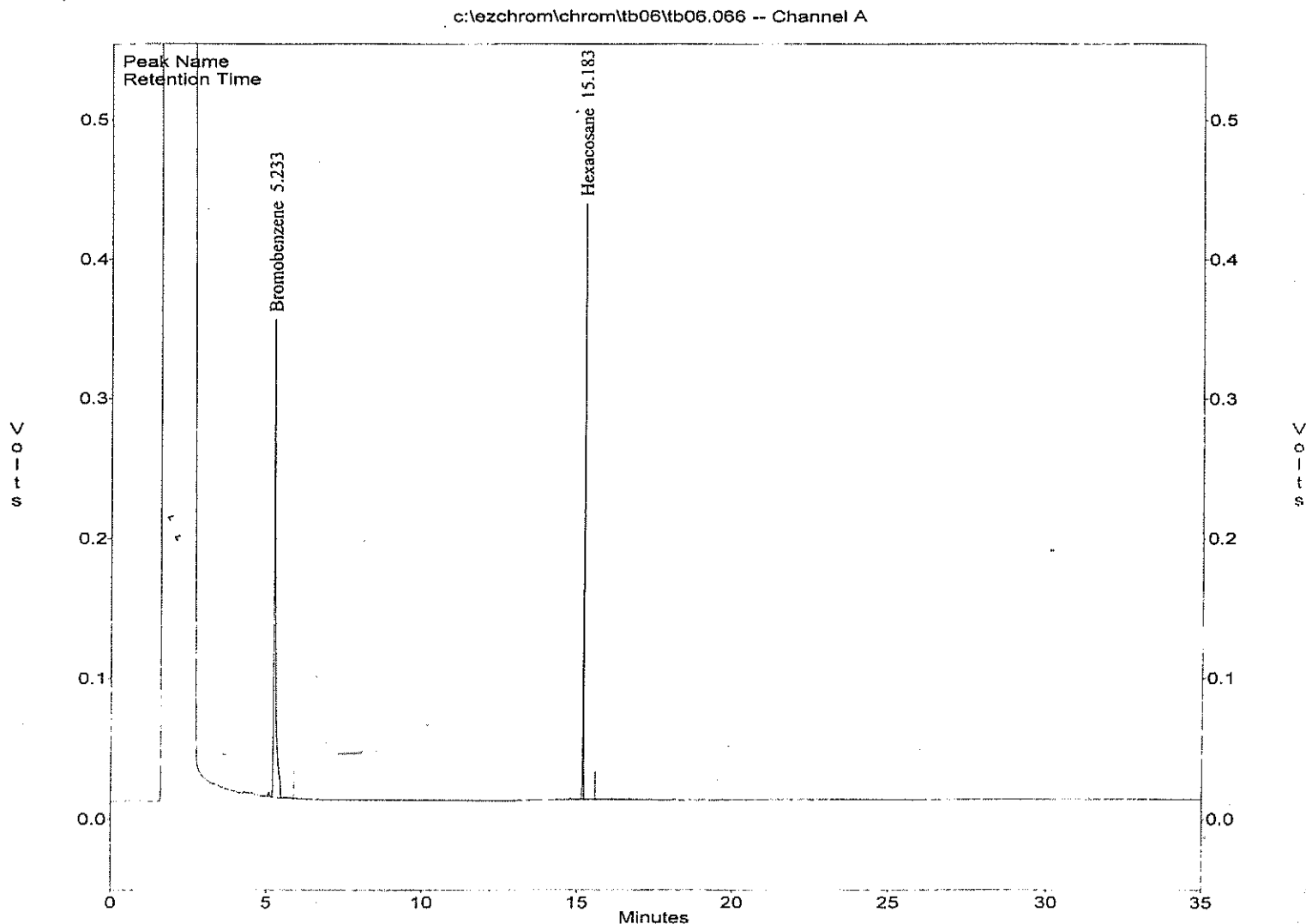
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	95	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tb06\tb06.066
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06B050-01
Acquired : Feb 08, 2006 13:46:03
Printed : Feb 08, 2006 16:08:10
User : JANE

Channel A Results

#	Peak Name	Ret. Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.233	1253884	14214.3	88.2
2	Hexacosane	15.183	687467	28984.5	23.7
G1	Diesel (TOTAL)		0	26500.7	0.0
G2	Diesel (C10-C24)		0	26460.6	0.0
G3	Diesel (C10-C28)		0	26478.8	0.0



METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 06B050                       Date Extracted: 02/08/06 10:10
Sample ID   : 0004-083                     Date Analyzed: 02/09/06 10:15
Lab Samp ID : B050-02T                     Dilution Factor: 10
Lab File ID : TB06095A                     Matrix          : SOIL
Ext Btch ID : DSB021S                      % Moisture       : 13.3
Calib. Ref. : TB06087A                     Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	5800	120	58

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	DO	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

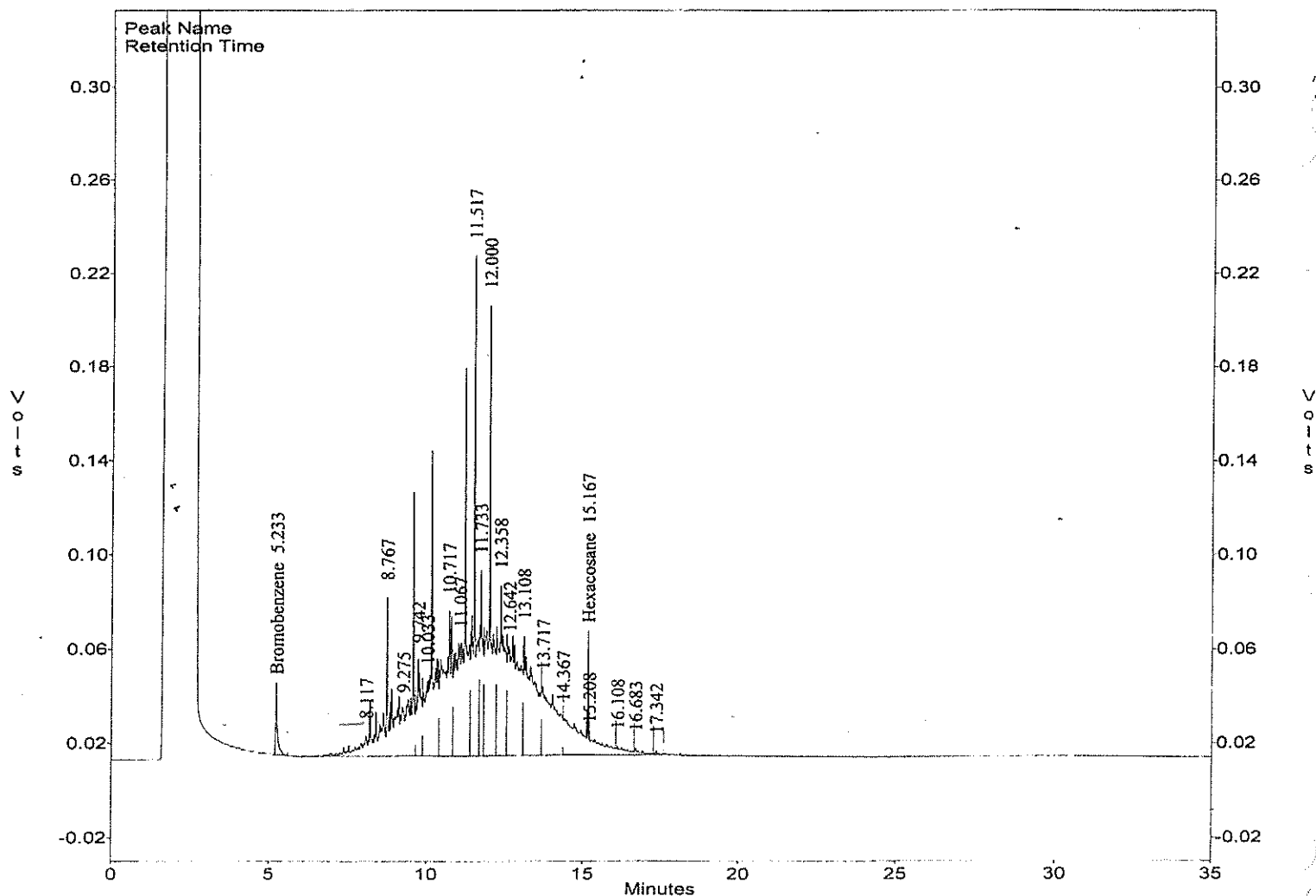
DO : Diluted Out

File : c:\ezchrom\chrom\tb06\tb06.095
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06B050-02T .1/1ML
Acquired : Feb 09, 2006 10:15:52
Printed : Feb 09, 2006 10:59:30
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.233	119435	14214.3	8.4
17	Hexacosane	15.167	108301	28984.5	3.7
G1	Diesel (TOTAL)		13327983	26500.7	502.9
G2	Diesel (C10-C24)		13211778	26460.6	499.3
G3	Diesel (C10-C28)		13282395	26478.8	501.6

c:\ezchrom\chrom\tb06\tb06.095 -- Channel A



5007

02.09.06

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Catch No.   : 06B050                      Date Extracted: 02/08/06 10:10
Sample ID   : 0004-084                    Date Analyzed: 02/08/06 14:28
Lab Samp ID : B050-03                     Dilution Factor: 1
Lab File ID : TB06067A                   Matrix       : SOIL
Ext Btch ID : 05B021S                    % Moisture    : 11.5
Calib. Ref. : TB06062A                   Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	11	5.6

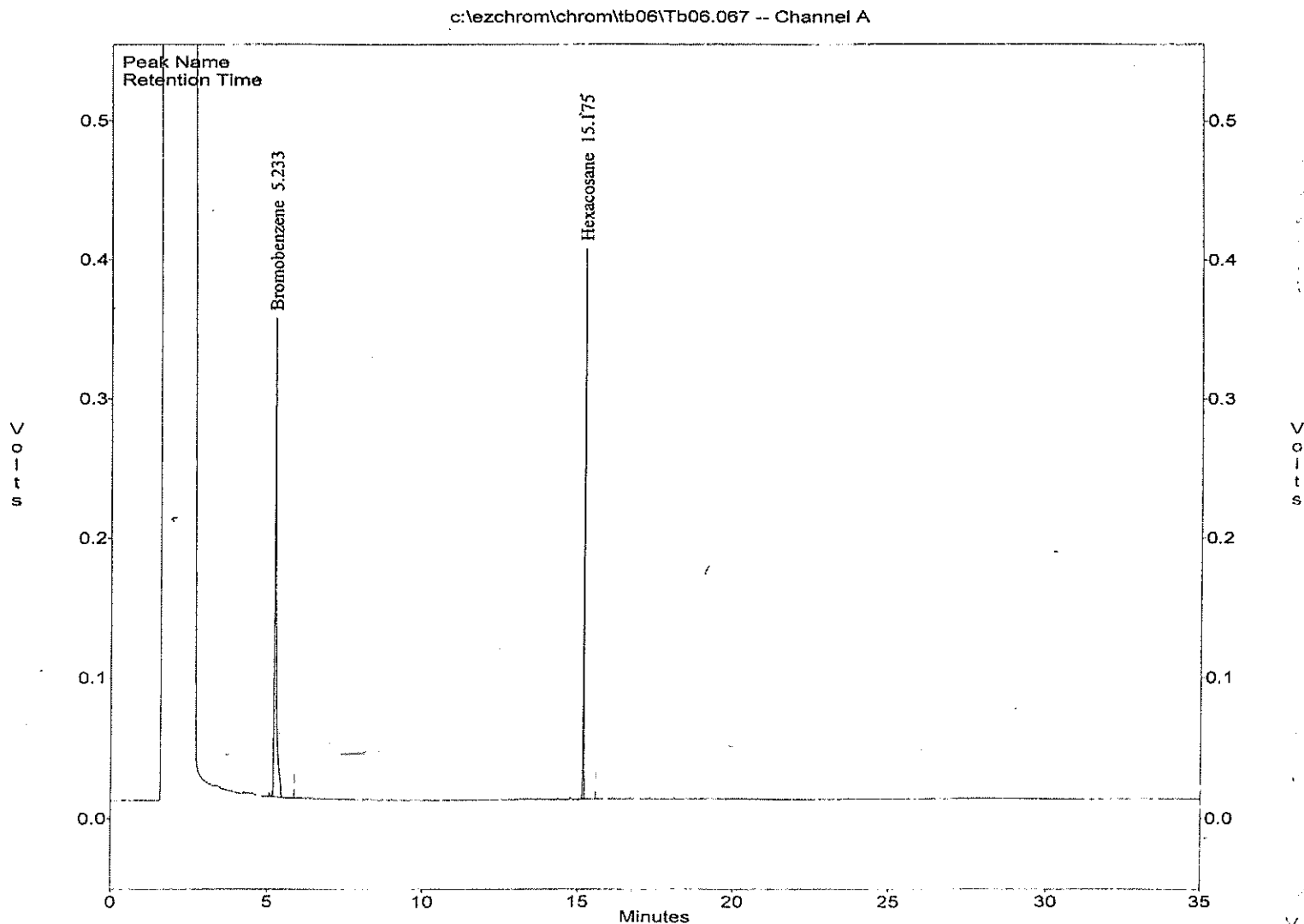
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	93	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tb06\tb06.067
Method : c:\ezchrom\methods\Ds50a31.met
Sample ID : 06B050-03
Acquired : Feb 08, 2006 14:28:42
Printed : Feb 08, 2006 15:03:44
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.233	1286782	14214.3	90.5
2	Hexacosane	15.175	674840	28984.5	23.3
G1	Diesel (TOTAL)		0	26500.7	0.0
G2	Diesel (C10-C24)		0	26460.6	0.0
G3	Diesel (C10-C28)		0	26478.8	0.0



5009

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client       : SES-TECH                      Date Collected: 02/07/06
Project      : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.    : 06B050                       Date Extracted: 02/08/06 10:10
Sample ID    : 0004-085                     Date Analyzed: 02/08/06 15:11 ~
Lab Samp ID  : 8050-04                      Dilution Factor: 1
Lab File ID  : TB06068A                    Matrix       : SOIL
Ext Btch ID  : DSB021S                     % Moisture    : 20.1
Calib. Ref.  : TB06062A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	1100	13	6.3

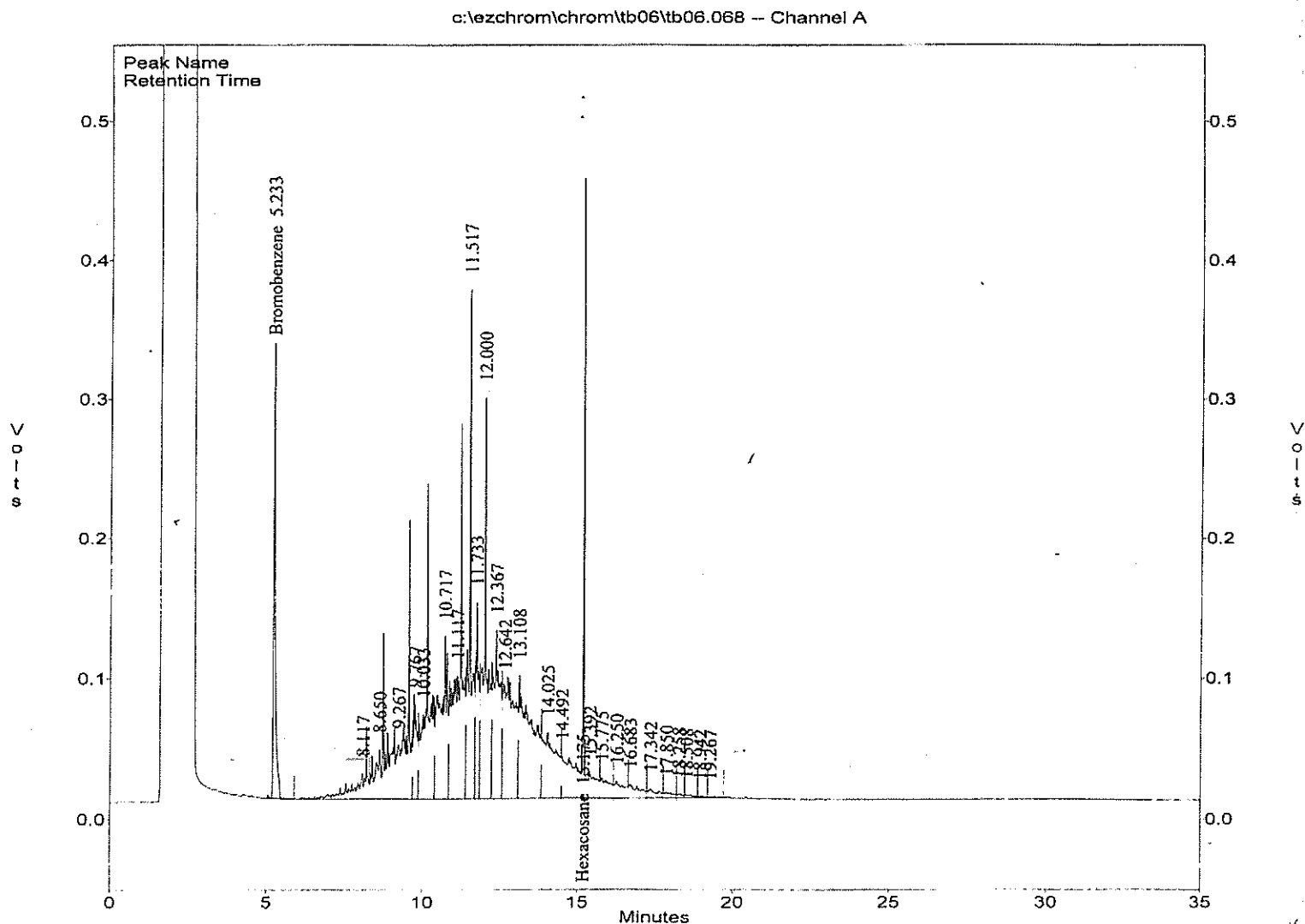
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	114	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tb06\tb06.068
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06B050-04
Acquired : Feb 08, 2006 15:11:22
Printed : Feb 08, 2006 16:08:41
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.233	1266775	14214.3	89.1
17	Hexacosane	15.175	823829	28984.5	28.4
G1	Diesel (TOTAL)		25177088	26500.7	950.1
G2	Diesel (C10-C24)		23201056	26460.6	876.8
G3	Diesel (C10-C28)		24400756	26478.8	921.5



5011

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02.06.06

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 068050                       Date Extracted: 02/08/06 10:10
Sample ID   : 0004-086                     Date Analyzed: 02/08/06 15:54 ✓
Lab Samp ID : 8050-05                      Dilution Factor: 1
Lab File ID : TB06069A                    Matrix       : SOIL
Ext Btch ID : DSB021S                     % Moisture    : 11.2
Calib. Ref. : TB06062A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	11	5.6

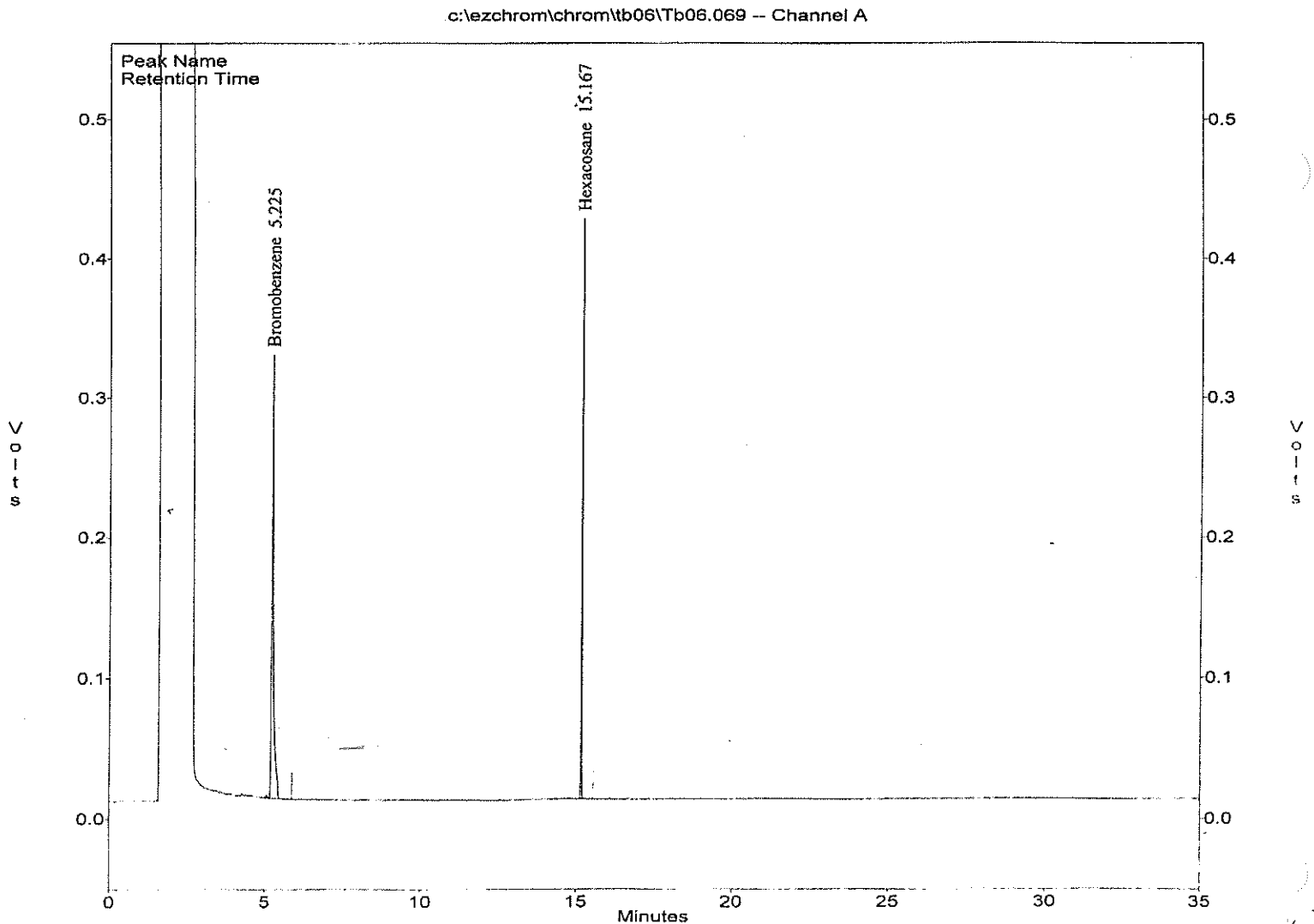
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	96	65-135

RL : Reporting Limit ✓
 Parameter H-C Range
 Diesel C10-C24

File : c:\ezchrom\chrom\tb06\tb06.069
Method : c:\ezchrom\methods\Ds50a31.met
Sample ID : 06B050-05
Acquired : Feb 08, 2006 15:54:05
Printed : Feb 08, 2006 16:29:07
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.225	1251665	14214.3	88.1
2	Hexacosane	15.167	695762	28984.5	24.0
G1	Diesel (TOTAL)		0	26500.7	0.0
G2	Diesel (C10-C24)		0	26460.6	0.0
G3	Diesel (C10-C28)		0	26478.8	0.0



METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client       : SES-TECH                      Date Collected: 02/07/06
Project      : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.    : 06B050                       Date Extracted: 02/08/06 10:10
Sample ID:   0004-087                       Date Analyzed: 02/08/06 18:02
Lab Samp ID: 8050-06                       Dilution Factor: 1
Lab File ID: TB06072A                     Matrix       : SOIL
Ext Batch ID: OSB021S                     % Moisture    : 11.3
Calib. Ref.: TB06062A                     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	11	5.6

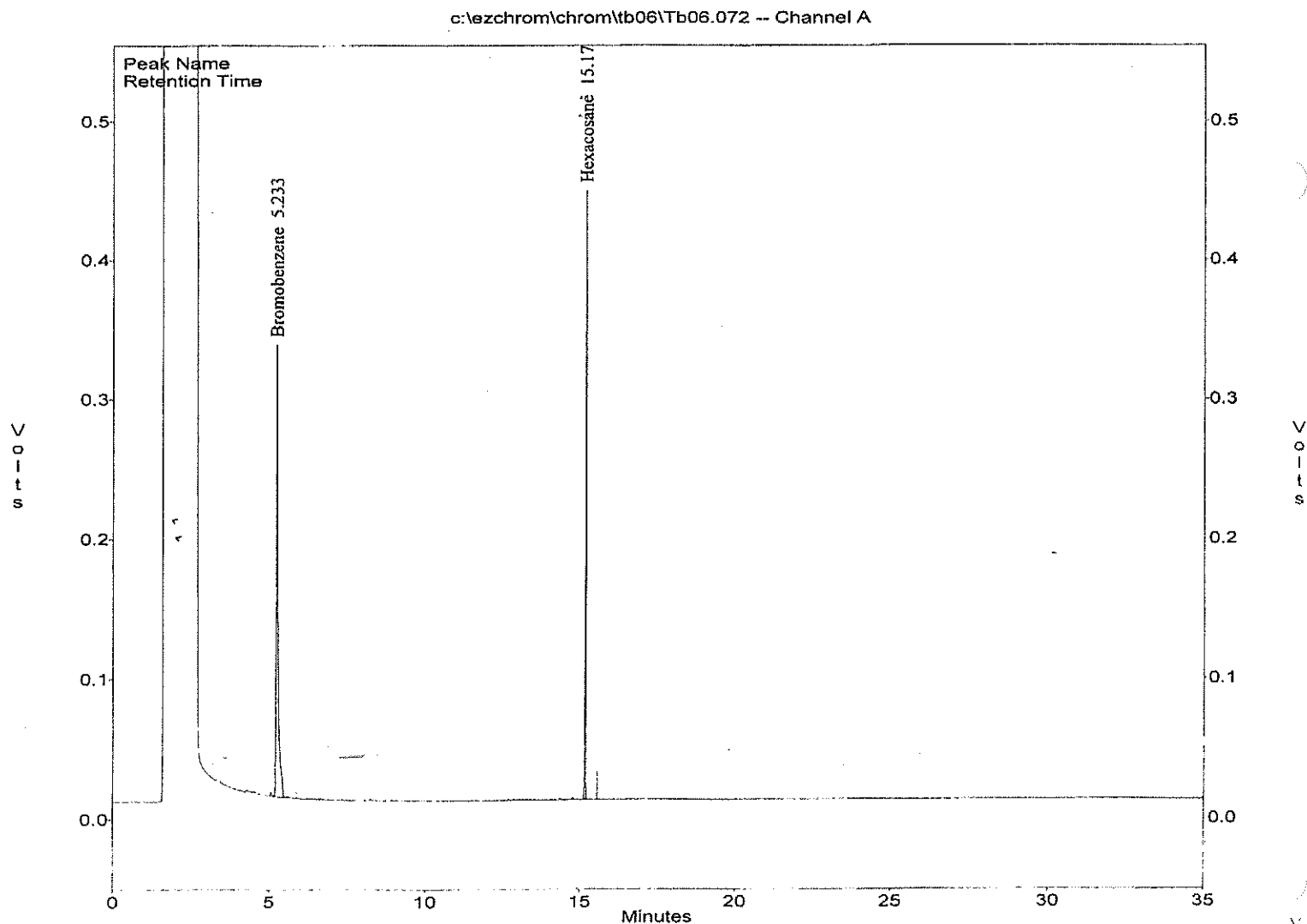
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	96	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tb06\tb06.072
Method : c:\ezchrom\methods\Ds50a31.met
Sample ID : 06B050-06
Acquired : Feb 08, 2006 18:02:10
Printed : Feb 08, 2006 18:37:12
User : JANE

Channel A Results

#	Peak Name	Ret. Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.233	1243585	14214.3	87.5
2	Hexacosane	15.175	696689	28984.5	24.0
G1	Diesel (TOTAL)		0	26500.7	0.0
G2	Diesel (C10-C24)		0	26460.6	0.0
G3	Diesel (C10-C28)		0	26478.8	0.0



METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 06B050                      Date Extracted: 02/08/06 10:10
Sample ID   : 0004-088                    Date Analyzed: 02/08/06 18:44
Lab Samp ID : B050-07                     Dilution Factor: 1
Lab File ID : TB06073A                   Matrix       : SOIL
Ext Btch ID : DSB021S                    % Moisture    : 12.1
Calib. Ref. : TB06062A                   Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	11	5.7

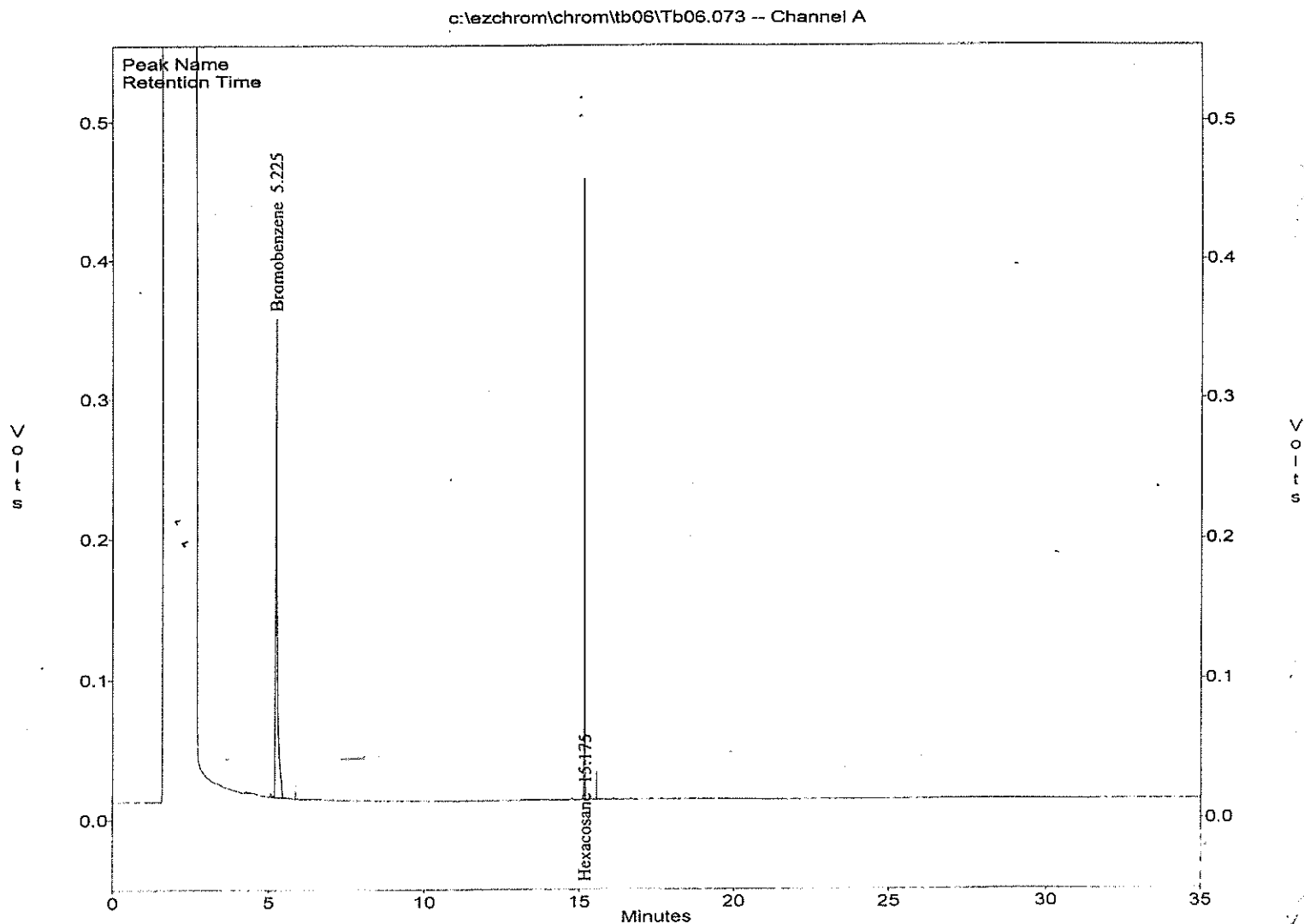
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	97	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tb06\tb06.073
Method : c:\ezchrom\methods\Ds50a31.met
Sample ID : 06B050-07
Acquired : Feb 08, 2006 18:44:51 ✓
Printed : Feb 08, 2006 19:19:52
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.225	1297423	14214.3	91.3
2	Hexacosane	15.175	703980	28984.5	24.3
G1	Diesel (TOTAL)		0	26500.7	0.0
G2	Diesel (C10-C24)		0	26460.6	0.0
G3	Diesel (C10-C28)		0	26478.8	0.0



5017

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 06B050                      Date Extracted: 02/08/06 10:10
Sample ID   : 0004-089                    Date Analyzed: 02/08/06 22:59 ✓
Lab Samp ID : B050-08                     Dilution Factor: 1
Lab File ID : TB06079A                   Matrix       : SOIL
Ext Btch ID : DSB021S                     % Moisture    : 18.3
Calib. Ref. : TB06074A                   Instrument ID  : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	2600 /	12	6.1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	119	65-135

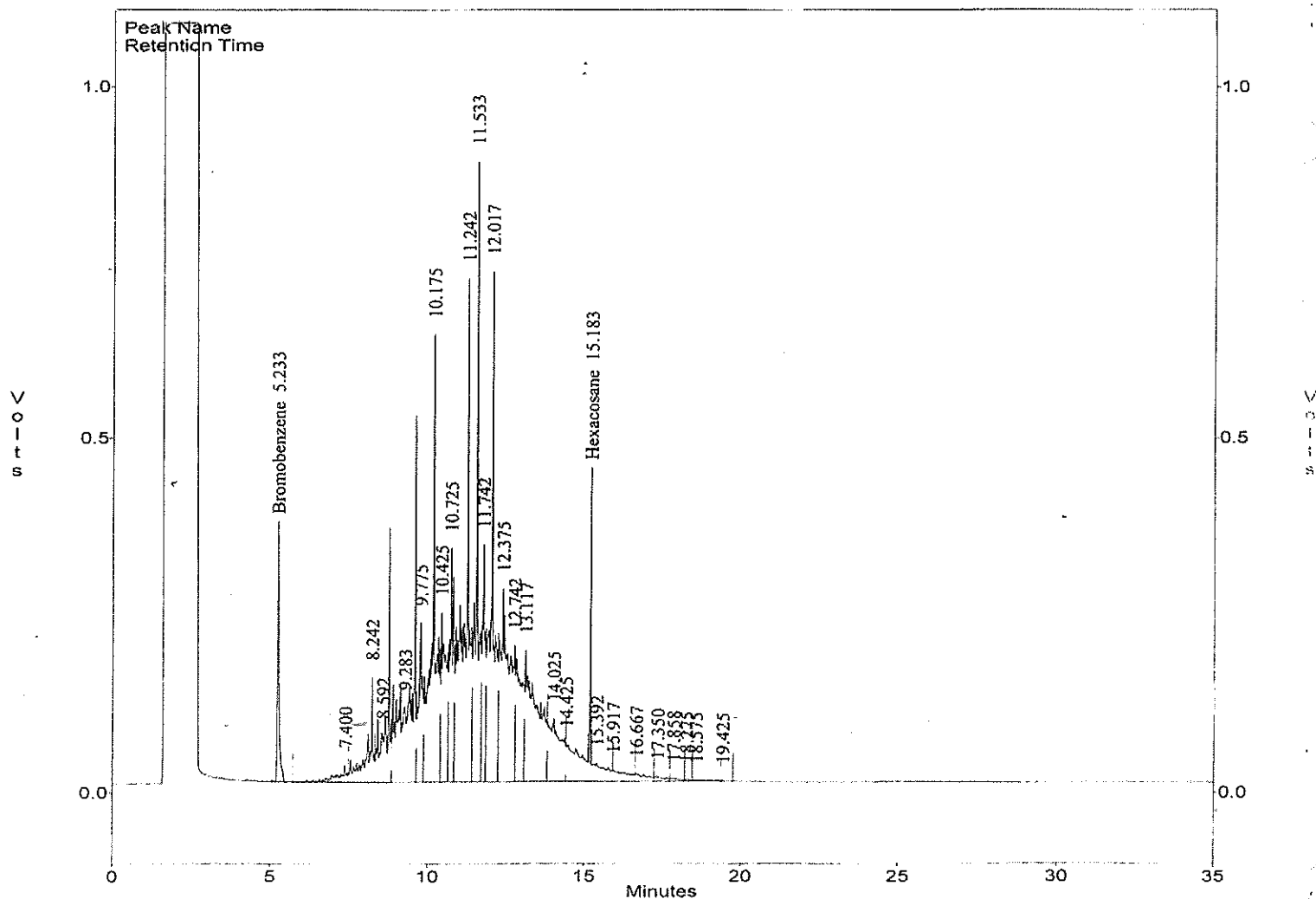
RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tb06\tb06.079
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06B050-08
Acquired : Feb 08, 2006 22:59:30
Printed : Feb 09, 2006 10:12:20
User : JANE

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.233	1362435	14214.3	95.8
19	Hexacosane	15.183	864515	28984.5	29.8
G1	Diesel (TOTAL)		58842028	26500.7	2220.4
G2	Diesel (C10-C24)		56186532	26460.6	2123.4
G3	Diesel (C10-C28)		58275616	26478.8	2200.8

c:\ezchrom\chrom\tb06\tb06.079 -- Channel A



5019

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METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 068050                       Date Extracted: 02/08/06 10:10
Sample ID   : 0004-090                     Date Analyzed: 02/08/06 20:52
Lab Samp ID : B050-09                      Dilution Factor: 1
Lab File ID : TB06076A                    Matrix       : SOIL
Ext Btch ID : DSB021S                     % Moisture    : 9.3
Calib. Ref. : TB06074A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	11	5.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	90	65-135

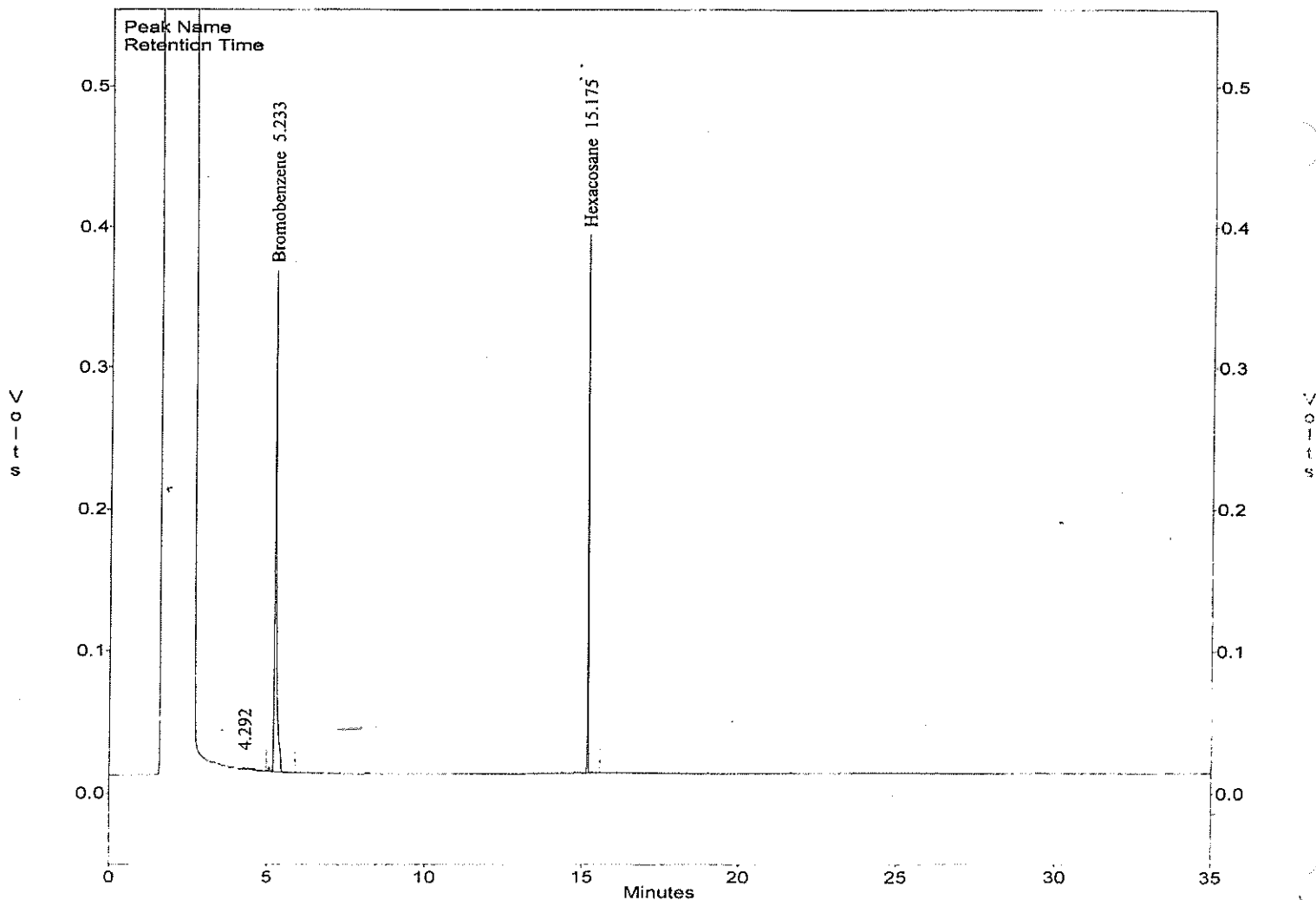
RL : Reporting Limit
 Parameter H-C Range
 Diesel C10-C24

File : c:\ezchrom\chrom\tb06\tb06.076
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06B050-09
Acquired : Feb 08, 2006 20:52:27
Printed : Feb 09, 2006 10:11:51
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
2	Bromobenzene	5.233	1304984	14214.3	91.8
3	Hexacosane	15.175	654548	28984.5	22.6
G1	Diesel (TOTAL)		26841	26500.7	1.0
G2	Diesel (C10-C24)		0	26460.6	0.0
G3	Diesel (C10-C28)		0	26478.8	0.0

c:\ezchrom\chrom\tb06\tb06.076 -- Channel A



METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 06B050                       Date Extracted: 02/08/06 10:10
Sample ID   : 0004-091                     Date Analyzed: 02/08/06 21:34
Lab Samp ID : B050-10                      Dilution Factor: 1
Lab File ID : TB06077A                    Matrix          : SOIL
Ext Btch ID : DSB021S                     % Moisture       : 15.9
Calib. Ref. : TB06074A                    Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	230	12	5.9

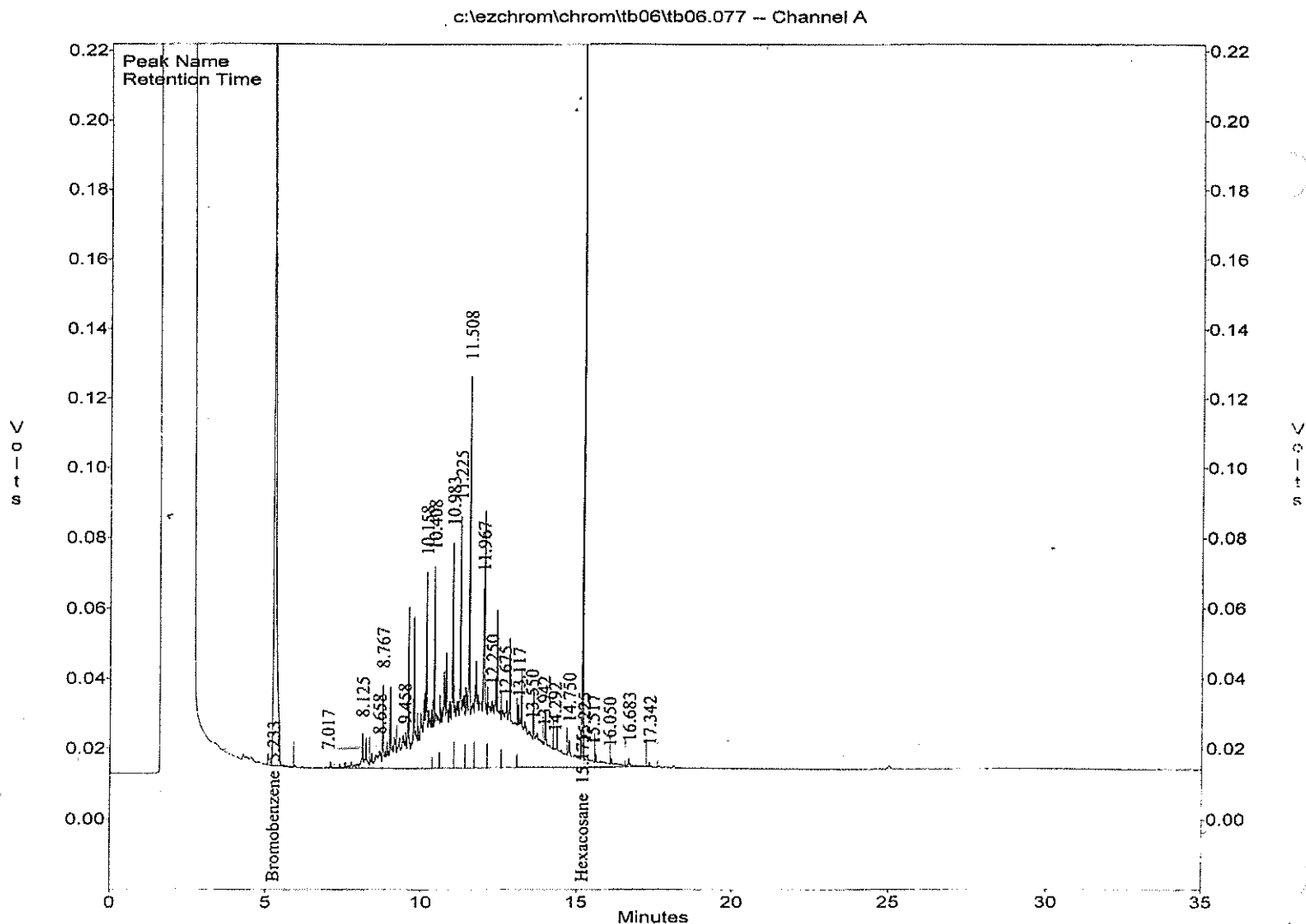
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	98	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tb06\tb06.077
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06B050-10
Acquired : Feb 08, 2006 21:34:47
Printed : Feb 09, 2006 10:12:00
User : JANE

Channel A Results

#	Peak Name	Ret. Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.233	1271838	14214.3	89.5
20	Hexacosane	15.175	710593	28984.5	24.5
G1	Diesel (TOTAL)		5274692	26500.7	199.0
G2	Diesel (C10-C24)		5143212	26460.6	194.4
G3	Diesel (C10-C28)		5254567	26478.8	198.4



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09.09.06

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Sent       : SES-TECH                      Date Collected: 02/07/06
Project    : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.  : 068050                       Date Extracted: 02/08/06 10:10
Sample ID  : 0004-092                     Date Analyzed: 02/08/06 23:41 ✓
Lab Samp ID: 8050-11                      Dilution Factor: 1
Lab File ID: TB06080A                     Matrix       : SOIL
Ext Btch ID: DSB021S                      % Moisture    : 15.6
Calib. Ref.: TB06074A                     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	850	12	5.9

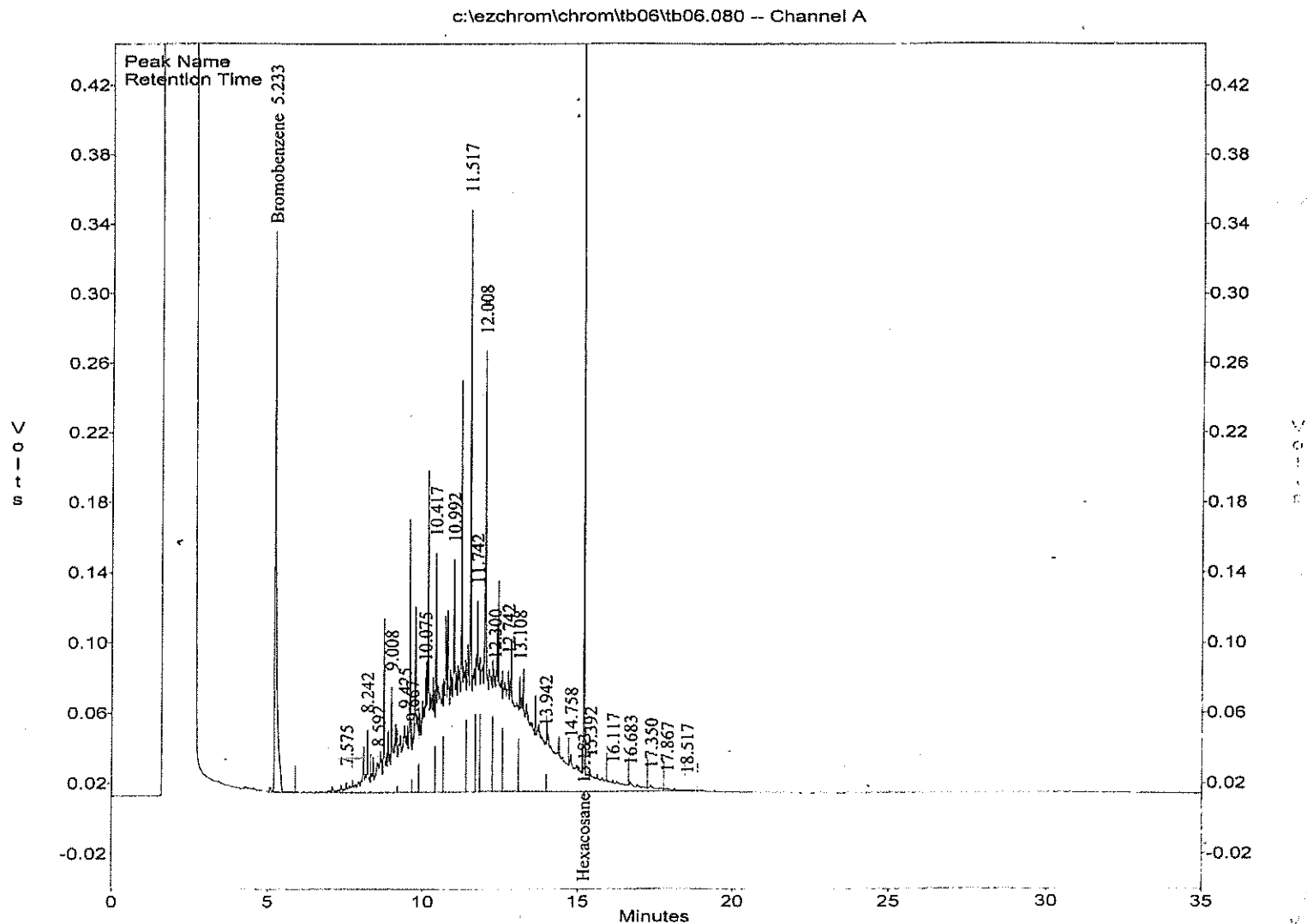
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	108	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tb06\tb06.080
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06B050-11
Acquired : Feb 08, 2006 23:41:50
Printed : Feb 09, 2006 10:12:31
User : JANE

Channel A Results

#	Peak Name	Ret. Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.233	1220831	14214.3	85.9
19	Hexacosane	15.183	780306	28984.5	26.9
G1	Diesel (TOTAL)		19693328	26500.7	743.1
G2	Diesel (C10-C24)		18945552	26460.6	716.0
G3	Diesel (C10-C28)		19494792	26478.8	736.2



5025

JP
02-09-06

QC SUMMARIES

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client       : SES-TECH                      Date Collected: NA
Project      : CAMP PENDLETON, UST SITE 14131 Date Received: 02/08/06
Batch No.    : 06B050                       Date Extracted: 02/08/06 10:10
Sample ID    : MBLK1S                       Date Analyzed: 02/08/06 12:20
Lab Samp ID  : DSB021SB                     Dilution Factor: 1
Lab File ID  : TB06064A                     Matrix       : SOIL
Ext Btch ID  : DSB021S                      % Moisture    : NA
Calib. Ref.  : TB06062A                     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	10	5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	97	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
TCH NO.: 068050
METHOD: METHOD 3550B/8015B

MATRIX: SOIL % MOISTURE: NA
DILUTION FACTOR: 1
SAMPLE ID: MBLK1S
LAB SAMP ID: DSB021SB DSB021SL
LAB FILE ID: TB06064A TB06065A
DATE EXTRACTED: 02/08/0610:10 02/08/0610:10 DATE COLLECTED: NA
DATE ANALYZED: 02/08/0612:20 02/08/0613:03 DATE RECEIVED: 02/08/06
PREP. BATCH: DSB021S DSB021S
CALIB. REF: TB06062A TB06062A

ACCESSION:

PARAMETER	BLNK RSLT (mg/kg)	SPIKE AMT (mg/kg)	BS RSLT (mg/kg)	BS % REC	QC LIMIT (%)
Diesel	ND	500	495	99	65-135

SURROGATE PARAMETER	SPIKE AMT (mg/kg)	BS RSLT (mg/kg)	BS % REC	QC LIMIT (%)
Hexacosane	25	25.5	102	65-135

EMAX QUALITY CONTROL DATA
 MS/MSD ANALYSIS

 CLIENT: SES-TECH
 PROJECT: CAMP PENDLETON, UST SITE 14131
 BATCH NO.: 06B050
 METHOD: METHOD 3550B/8015B

 =====
 MATRIX: SOIL % MOISTURE: 11.2
 DILUTION FACTOR: 1 1 1
 SAMPLE ID: 0004-086
 LAB SAMP ID: B050-05 B050-05M B050-05S
 LAB FILE ID: TB06069A TB06070A TB06071A
 DATE EXTRACTED: 02/08/0610:10 02/08/0610:10 02/08/0610:10 DATE COLLECTED: 02/07/06
 DATE ANALYZED: 02/08/0615:54 02/08/0616:36 02/08/0617:19 DATE RECEIVED: 02/07/06
 PREP. BATCH: DSB021S DSB021S DSB021S
 CALIB. REF: TB06062A TB06062A TB06062A

 ACCESSION:

PARAMETER	SMPL RSLT (mg/kg)	SPIKE AMT (mg/kg)	MS RSLT (mg/kg)	MS % REC	SPIKE AMT (mg/kg)	MSD RSLT (mg/kg)	MSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Diesel	ND	563	556	99	563	529	94	5	65-135	35

 =====

SURROGATE PARAMETER	SPIKE AMT (mg/kg)	MS RSLT (mg/kg)	MS % REC	SPIKE AMT (mg/kg)	MSD RSLT (mg/kg)	MSD % REC	QC LIMIT (%)
Hexacosane	28.2	27.6	98	28.2	26.9	95	65-135

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14131

SW 1312/5030B/8260B
SPLP VOLATILE ORGANICS BY GC/MS

SDG#: 06B050A

2000

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG: 06B050A

SW 1312/5030B/8260B SPLP VOLATILE ORGANICS BY GC/MS

Three (3) soil samples were received on 02/07/06 for SPLP Volatile Organic analysis by Method 1312/5030B/8260B in accordance with USEPA SW846, 3rd ed.

1. Holding Time

Analytical holding time was met.

2. Tuning and Calibration

Tuning and calibration were carried out at 12-hour interval. All QC requirements were met.

3. Method Blank

Method blanks were free of contamination at half of the reporting limit.

4. Surrogate Recovery

Recoveries were within QC limit.

5. Lab Control Sample/Lab Control Sample Duplicate

Recoveries were within QC limit.

6. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
SPLP VOLATILE ORGANICS BY GC/MS

SDG NO. : 068050A
Instrument ID : I-001

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14131

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	WATER		Extraction DateTime	Sample Data FN	Calibration Prep.		Notes
				Analysis DateTime				Data FN	Batch	
MBLK1W	V001B28Q	1	NA	02/14/0621:29		02/14/0621:29	RBV342	RAV257	V001B28	Method Blank
LCST1W	V001B28L	1	NA	02/14/0619:36		02/14/0619:36	RBV339	RAV257	V001B28	Lab Control Sample (LCS)
LCD1W	V001B28C	1	NA	02/14/0620:14		02/14/0620:14	RBV340	RAV257	V001B28	LCS Duplicate
MBLK1S	SL8003S8	1	NA	02/14/0622:07		02/14/0622:07	RBV343	RAV257	V001B28	Method Blank
0004-083	B050-02	1	NA	02/15/0603:08		02/15/0603:08	RBV351	RAV257	V001B28	Field Sample
0004-085	B050-04	1	NA	02/15/0603:46		02/15/0603:46	RBV352	RAV257	V001B28	Field Sample
0004-089	B050-08	1	NA	02/15/0604:24		02/15/0604:24	RBV353	RAV257	V001B28	Field Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Sample No.  : 068050A                      Date Extracted: 02/15/06 03:08
Sample ID   : 0004-083                     Date Analyzed: 02/15/06 03:08
Lab Samp ID : B050-02                      Dilution Factor: 1
Lab File ID : RBV351                      Matrix       : WATER
Ext Btch ID : V001B28                     % Moisture   : NA
Calib. Ref. : RAV257                      Instrument ID : I-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
DIBROMOBENZENE	ND	.5	.2
DIBROMOETHANE	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	104	65-135
TOLUENE-D8	100	75-125
BROMOFLUOROBENZENE	108	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis—
 D.O. : Diluted out
 SPLP Extraction Date: 02/13/06 17:30

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 06B050A                      Date Extracted: 02/15/06 03:46
Sample ID   : 0004-085                     Date Analyzed: 02/15/06 03:46
Lab Samp ID : 8050-04                      Dilution Factor: 1
Lab File ID : RBV352                      Matrix       : WATER
Ext Btch ID : V001828                     % Moisture   : NA
Calib. Ref. : RAV257                      Instrument ID : T-001
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
ETHYLBENZENE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	101	65-135
TOLUENE-D8	100	75-125
BROMOFLUOROBENZENE	108	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out
 SPLP Extraction Date: 02/13/06 17:30

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Sample No.  : 06B050A                      Date Extracted: 02/15/06 04:24
Sample ID   : 0004-089                     Date Analyzed: 02/15/06 04:24
Lab Samp ID : B050-08                      Dilution Factor: 1
Lab File ID : RBV353                      Matrix       : WATER
Ext Btch ID : V001B28                     % Moisture    : NA
Calib. Ref. : RAV257                      Instrument ID : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
1,2,4-TRICHLOROBENZENE	.39J	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	97	65-135
TOLUENE-D8	99	75-125
BROMOFLUOROBENZENE	108	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out
 SPLP Extraction Date: 02/13/06 17:30

QC SUMMARIES

```

=====
Client      : SES-TECH                      Date Collected: NA
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/14/06
In No.      : 06B050A                      Date Extracted: 02/14/06 21:29
Sample ID   : MBLK1W                       Date Analyzed: 02/14/06 21:29
Lab Samp ID : V001B28Q                     Dilution Factor: 1
Lab File ID : RBV342                      Matrix       : WATER
Ext Btch ID : V001B28                     % Moisture    : NA
Calib. Ref. : RAV257                      Instrument ID : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
DIBROMOBENZENE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	101	65-135
TOLUENE-D8	101	75-125
BROMOFLUOROBENZENE	107	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

EMAX QUALITY CONTROL DATA
 LCS/LCD ANALYSIS

 CLIENT: SES-TECH
 PROJECT: CAMP PENDLETON, UST SITE 14131
 BATCH NO.: 06B050A
 METHOD: SW 1312/5030B/8260B

 =====
 MATRIX: WATER % MOISTURE: NA
 DILUTION FACTOR: 1 1
 SAMPLE ID: MBLK1W
 LAB SAMP ID: V001B28Q V001B28L V001B28C
 LAB FILE ID: RBV342 RBV339 RBV340
 DATE EXTRACTED: 02/14/0621:29 02/14/0619:36 02/14/0620:14 DATE COLLECTED: NA
 DATE ANALYZED: 02/14/0621:29 02/14/0619:36 02/14/0620:14 DATE RECEIVED: 02/14/06
 PREP. BATCH: V001B28 V001B28 V001B28
 CALIB. REF: RAV257 RAV257 RAV257

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
1,1-Dichloroethene	ND	10	9.2	92	10	9	90	2	75-125	20
Benzene	ND	10	9.58	96	10	9.39	94	2	75-125	20
Chlorobenzene	ND	10	10.3	103	10	10.1	101	2	75-125	20
Toluene	ND	10	9.5	95	10	9.44	94	1	75-125	20
Trichloroethene	ND	10	10.4	104	10	10.1	101	2	75-125	20

 =====

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	10	9.92	99	10	9.79	98	65-135
Toluene-d8	10	10.5	105	10	10.4	104	75-125
Bromofluorobenzene	10	10.7	107	10	10.7	107	75-125

```

=====
Client      : SES-TECH                      Date Collected: NA
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/14/06
Sample No.  : 068050A                      Date Extracted: 02/14/06 22:07
Sample ID   : MBLK1S                       Date Analyzed: 02/14/06 22:07
Lab Samp ID : SLB003SB                     Dilution Factor: 1
Lab File ID : RBV343                      Matrix       : WATER
Ext Btch ID : V001B28                     % Moisture   : NA
Calib. Ref. : RAV257                      Instrument ID : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
DIBROMOBENZENE	ND	.5	.2
DIBROMOETHANE	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	98	65-135
TOLUENE-D8	98	75-125
BROMOFLUOROBENZENE	110	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out
 SPLP Extraction Date: 02/13/06 17:30

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14131

SW 1312/3520C/8270C SIM
SPLP SEMI VOLATILE ORGANICS BY GC/MS

SDG#: 06B050A

3000

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG: 06B050A

SW 1312/3520C/8270C SIM SPLP SEMI VOLATILE ORGANICS BY GC/MS

Three (3) soil samples were received on 02/07/06 for SPLP Semi Volatile Organic analysis by Method 1312/3520C/8270C SIM in accordance with USEPA SW846, 3rd ed.

1. Holding Time

Analytical holding time was met.

2. Tuning and Calibration

Tuning and calibration were carried out at 12-hour interval. All QC requirements were met.

3. Method Blank

Method blanks were free of contamination at half of the reporting limit.

4. Surrogate Recovery

Recoveries were within QC limit except Terphenyl-d14 in samples B050-02 and -04 were out of QC limit.

5. Lab Control Sample/Lab Control Sample Duplicate

Recoveries were within QC limit.

6. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception.

One analyte in B050-08 was manually reintegrated to correct for improper integration. Chromatograms of before and after manual integration were kept on file for review.

LAB CHRONICLE
SPLP SEMI VOLATILE ORGANICS BY GC/MS

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14131
SDG NO. : 06B050A
Instrument ID : T-052

WATER									
Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Prep. Data FN Batch	Notes	
MBLK1W	SVB030WB	1	NA	02/16/0618:15	02/15/0619:00	RBK231	RAK026 SVB030W	Method Blank	
MBLK1W	SVB030WB	1	NA	02/16/0618:15	02/15/0619:00	RBK231	RAK026 SVB030W	Method Blank	
LCS1W	SVB030WL	1	NA	02/16/0618:34	02/15/0619:00	RBK232	RAK026 SVB030W	Lab Control Sample (LCS)	
LCD1W	SVB030WC	1	NA	02/16/0618:52	02/15/0619:00	RBK233	RAK026 SVB030W	LCS Duplicate	
MBLK1S	SPB003S8	1	NA	02/16/0619:30	02/15/0619:00	RBK235	RAK026 SVB030W	Method Blank	
0004-083	B050-02	1	NA	02/16/0620:46	02/15/0619:00	RBK239	RAK026 SVB030W	Field Sample	
0004-085	B050-04	1	NA	02/16/0621:05	02/15/0619:00	RBK240	RAK026 SVB030W	Field Sample	
0004-089	B050-08	1	NA	02/16/0621:24	02/15/0619:00	RBK241	RAK026 SVB030W	Field Sample	

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

SW 1312/3520C/8270C SIM
SPLP SEMI VOLATILE ORGANICS BY GC/MS

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 06B050A                      Date Extracted: 02/15/06 19:00
Sample ID   : 0004-083                     Date Analyzed: 02/16/06 20:46
Lab Samp ID : B050-02                      Dilution Factor: 1
Lab File ID : RBK239                       Matrix          : WATER
Ext Btch ID : SVB030W                      % Moisture       : NA
Calib. Ref. : RAK026                       Instrument ID    : T-052
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	1	.2
ACENAPHTHYLENE	ND	1	.2
ANTHRACENE	ND	2	.2
BENZO(A)ANTHRACENE	ND	2	.2
BENZO(A)PYRENE	ND	1	.2
BENZO(B)FLUORANTHENE	ND	1	.2
BENZO(K)FLUORANTHENE	ND	2	.2
BENZO(G,H,I)PERYLENE	ND	1	.2
CHRYSENE	ND	2	.2
DIBENZO(A,H)ANTHRACENE	ND	1	.2
FLUORANTHENE	ND	2	.2
FLUORENE	ND	2	.2
INDENO(1,2,3-CD)PYRENE	ND	1	.2
NAPHTHALENE	ND	1	.2
PHENANTHRENE	ND	1	.2
PYRENE	ND	2	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	32*	50-130

RL: Reporting Limit
SPLP Extracted on 02/13/06 18:00

SW 1312/3520C/8270C SIM
SPLP SEMI VOLATILE ORGANICS BY GC/MS

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 06B050A                      Date Extracted: 02/15/06 19:00
Sample ID   : 0004-085                     Date Analyzed: 02/16/06 21:05
Lab Samp ID : B050-04                      Dilution Factor: 1
Lab File ID : RBK240                       Matrix          : WATER
Ext Btch ID : SVB030W                     % Moisture      : NA
Calib. Ref. : RAK026                      Instrument ID   : T-052
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	.21J	1	.2
ACENAPHTHYLENE	ND	1	.2
ANTHRACENE	ND	2	.2
BENZO(A)ANTHRACENE	ND	2	.2
BENZO(A)PYRENE	ND	1	.2
BENZO(B)FLUORANTHENE	ND	1	.2
BENZO(K)FLUORANTHENE	ND	2	.2
BENZO(G,H,I)PERYLENE	ND	1	.2
CHRYSENE	ND	2	.2
DIBENZO(A,H)ANTHRACENE	ND	1	.2
FLUORANTHENE	ND	2	.2
FLUORENE	ND	2	.2
INDENO(1,2,3-CD)PYRENE	ND	1	.2
NAPHTHALENE	ND	1	.2
PHENANTHRENE	ND	1	.2
PYRENE	ND	2	.2

PROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	39*	50-130

RL: Reporting Limit
SPLP Extracted on 02/13/06 18:00

SW 1312/3520C/8270C SIM
SPLP SEMI VOLATILE ORGANICS BY GC/MS

```

=====
Client       : SES-TECH                      Date Collected: 02/07/06
Project      : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.    : 06B050A                      Date Extracted: 02/15/06 19:00
Sample ID    : 0004-089                     Date Analyzed: 02/16/06 21:24
Lab Samp ID  : B050-08                      Dilution Factor: 1
Lab File ID  : RBK241                       Matrix          : WATER
Ext Btch ID  : SVB030W                      % Moisture      : NA
Calib. Ref.  : RAK026                      Instrument ID   : T-052
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	.41J	1	.2
ACENAPHTHYLENE	ND	1	.2
ANTHRACENE	ND	2	.2
BENZO(A)ANTHRACENE	ND	2	.2
BENZO(A)PYRENE	ND	1	.2
BENZO(B)FLUORANTHENE	ND	1	.2
BENZO(K)FLUORANTHENE	ND	2	.2
BENZO(G,H,I)PERYLENE	ND	1	.2
CHRYSENE	ND	2	.2
DIBENZO(A,H)ANTHRACENE	ND	1	.2
FLUORANTHENE	ND	2	.2
FLUORENE	.41J	2	.2
INDENO(1,2,3-CD)PYRENE	ND	1	.2
NAPHTHALENE	ND	1	.2
PHENANTHRENE	ND	1	.2
PYRENE	ND	2	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	54	50-130

RL: Reporting Limit
SPLP Extracted on 02/13/06 18:00

QC SUMMARIES

```
=====
Client       : SES-TECH                      Date Collected: NA
Project      : CAMP PENDLETON, UST SITE 14131 Date Received: 02/15/06
Batch No.    : 06B050A                      Date Extracted: 02/15/06 19:00
Sample ID    : MBLK1W                       Date Analyzed: 02/16/06 18:15
Lab Samp ID  : SVB030WB                     Dilution Factor: 1
Lab File ID  : RBK231                       Matrix       : WATER
Ext Btch ID  : SVB030W                      % Moisture    : NA
Calib. Ref.  : RAK026                      Instrument ID : T-052
=====
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	1	.2
ACENAPHTHYLENE	ND	1	.2
ANTHRACENE	ND	2	.2
BENZO(A)ANTHRACENE	ND	2	.2
BENZO(A)PYRENE	ND	1	.2
BENZO(B)FLUORANTHENE	ND	1	.2
BENZO(K)FLUORANTHENE	ND	2	.2
BENZO(G,H,I)PERYLENE	ND	1	.2
CHRYSENE	ND	2	.2
DIBENZO(A,H)ANTHRACENE	ND	1	.2
FLUORANTHENE	ND	2	.2
FLUORENE	ND	2	.2
INDENO(1,2,3-CD)PYRENE	ND	1	.2
NAPHTHALENE	ND	1	.2
PHENANTHRENE	ND	1	.2
PYRENE	ND	2	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	122	50-130

RL: Reporting Limit

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS



CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
H NO.: 06B050A
METHOD: SW 1312/3520C/8270C SIM

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: SVB030WB SVB030WL SVB030WC
LAB FILE ID: RBK231 RBK232 RBK233
DATE EXTRACTED: 02/15/0619:00 02/15/0619:00 02/15/0619:00 DATE COLLECTED: NA
DATE ANALYZED: 02/16/0618:15 02/16/0618:34 02/16/0618:52 DATE RECEIVED: 02/15/06
PREP. BATCH: SVB030W SVB030W SVB030W
CALIB. REF: RAK026 RAK026 RAK026

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Acenaphthene	ND	10	5.74	57	10	6.68	67	15	40-130	30
Acenaphthylene	ND	10	6.3	63	10	7.14	71	12	40-130	30
Anthracene	ND	10	7.25	73	10	8.39	84	15	50-130	30
Benzo(a)anthracene	ND	10	6.52	65	10	7.37	74	12	50-130	30
Benzo(a)pyrene	ND	10	6.69	67	10	7.43	74	11	50-130	30
Benzo(b)fluoranthene	ND	10	7.87	79	10	8.72	87	10	50-130	30
Benzo(k)fluoranthene	ND	10	5.12	51	10	5.75	58	12	30-150	30
Benzo(g,h,i)perylene	ND	10	6.43	64	10	7.22	72	12	50-130	30
Chrysene	ND	10	6.33	63	10	7.15	71	12	50-130	30
Dibenzo(a,h)anthracene	ND	10	6.58	66	10	7.33	73	11	40-140	30
Fluoranthene	ND	10	7.34	73	10	8.35	84	13	50-130	30
Indene	ND	10	6.53	65	10	7.52	75	14	40-130	30
Indeno(1,2,3-cd)pyrene	ND	10	6.6	66	10	7.28	73	10	30-140	30
Naphthalene	ND	10	5.65	57	10	6.38	64	12	30-130	30
Phenanthrene	ND	10	6.94	69	10	7.96	80	14	40-130	30
Pyrene	ND	10	7.21	72	10	8.25	82	13	40-130	30

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
Terphenyl-d14	10	9.32	93	10	10.7	107	50-130

3009

```

=====
Client       : SES-TECH                      Date Collected: NA
Project      : CAMP PENDLETON, UST SITE 14131 Date Received: 02/15/06
Batch No.    : 06B050A                      Date Extracted: 02/15/06 19:00
Sample ID    : MBLK1S                       Date Analyzed: 02/16/06 19:30
Lab Samp ID  : SPB003SB                     Dilution Factor: 1
Lab File ID  : RBK235                       Matrix       : WATER
Ext Btch ID  : SVB030W                     % Moisture    : NA
Calib. Ref.  : RAK026                      Instrument ID : T-052
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	1	.2
ACENAPHTHYLENE	ND	1	.2
ANTHRACENE	ND	2	.2
BENZO(A)ANTHRACENE	ND	2	.2
BENZO(A)PYRENE	ND	1	.2
BENZO(B)FLUORANTHENE	ND	1	.2
BENZO(K)FLUORANTHENE	ND	2	.2
BENZO(G,H,I)PERYLENE	ND	1	.2
CHRYSENE	ND	2	.2
DIBENZO(A,H)ANTHRACENE	ND	1	.2
FLUORANTHENE	ND	2	.2
FLUORENE	ND	2	.2
INDENO(1,2,3-CD)PYRENE	ND	1	.2
NAPHTHALENE	ND	1	.2
PHENANTHRENE	ND	1	.2
PYRENE	ND	2	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	108	50-130

RL: Reporting Limit

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14131

METHOD 1312/3520C/8015B
SPLP TOTAL PETROLEUM HYDROCARBONS
BY EXTRACTION

SDG#: 06B050A

5000

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG: 06B050A

METHOD 1312/3520C/8015B SPLP TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Three (3) soil samples were received on 02/07/06 for SPLP Total Petroleum Hydrocarbons by Extraction analysis by Method 1312/3520C/8015B in accordance with SW846 3RD Edition.

1. Holding Time

Analytical holding time was met. SPLP extraction was performed on 02/13/06 and completed on 02/14/06. 3520C extraction was performed on 02/15/06 and completed on 02/16/06.

2. Calibration

Initial calibration was seven points for Diesel. %RSDs were within 20%. Continuing calibrations were carried out at 12-hour intervals and all recoveries were within 85-115%.

3. Method Blank

Method blank was free of contamination at half of the reporting limit.

4. Surrogate Recovery

Hexacosane recovery in samples B050-04 and -08, both in the initial and re-analysis were out of QC limit due to matrix interference; however, Bromobenzene met the QC criteria. All others met the QC criteria.

5. Lab Control Sample/Lab Control Sample Duplicate

All recoveries were within QC limits.

6. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception. Sample results were quantitated from C10 to C24 using Diesel (C10-C24) calibration factor.

All the samples displayed diesel-like fuel pattern.

LAB CHRONICLE
SPLP TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

SDG NO. : 068050A
Instrument ID : GCT050

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14131

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	WATER		Extraction Date/Time	Sample Data FN	Calibration Prep.		Notes
				Analysis Date/Time				Data FN	Batch	
RBLK1W	DSB029WB	1	NA	02/16/0615:28		02/15/0619:00	TB16008A	TB16002A	DSB029W	Method Blank
LCS1W	DSB029WL	✓ 1	NA	02/16/0621:04		02/15/0619:00	TB16016A	TB16014A	DSB029W	Lab Control Sample (LCS)
LCD1W	DSB029WC	1	NA	02/16/0621:46		02/15/0619:00	TB16017A	TB16014A	DSB029W	LCS Duplicate
MBLK1S	SPB003SB	✓ 1	NA	02/16/0618:58		02/15/0619:00	TB16013A	TB16002A	DSB029W	Method Blank
0004-083	B050-02	1	NA	02/16/0622:27		02/15/0619:00	TB16018A	TB16014A	DSB029W	Field Sample
0004-085	B050-04	1	NA	02/16/0623:09		02/15/0619:00	TB16019A	TB16014A	DSB029W	Field Sample
0004-089	B050-08	1	NA	02/16/0623:51		02/15/0619:00	TB16020A	TB16014A	DSB029W	Field Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD 1312/3520C/8015B
SPLP TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 06B050A                      Date Extracted: 02/15/06 19:00
Sample ID   : 0004-083                     Date Analyzed: 02/16/06 22:27
Lab Samp ID : B050-02                      Dilution Factor: 1
Lab File ID : TB16018A                    Matrix          : WATER
Ext Btch ID : DSB029W                     % Moisture       : NA
Calib. Ref. : TB16014A                    Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	1	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	66	65-135

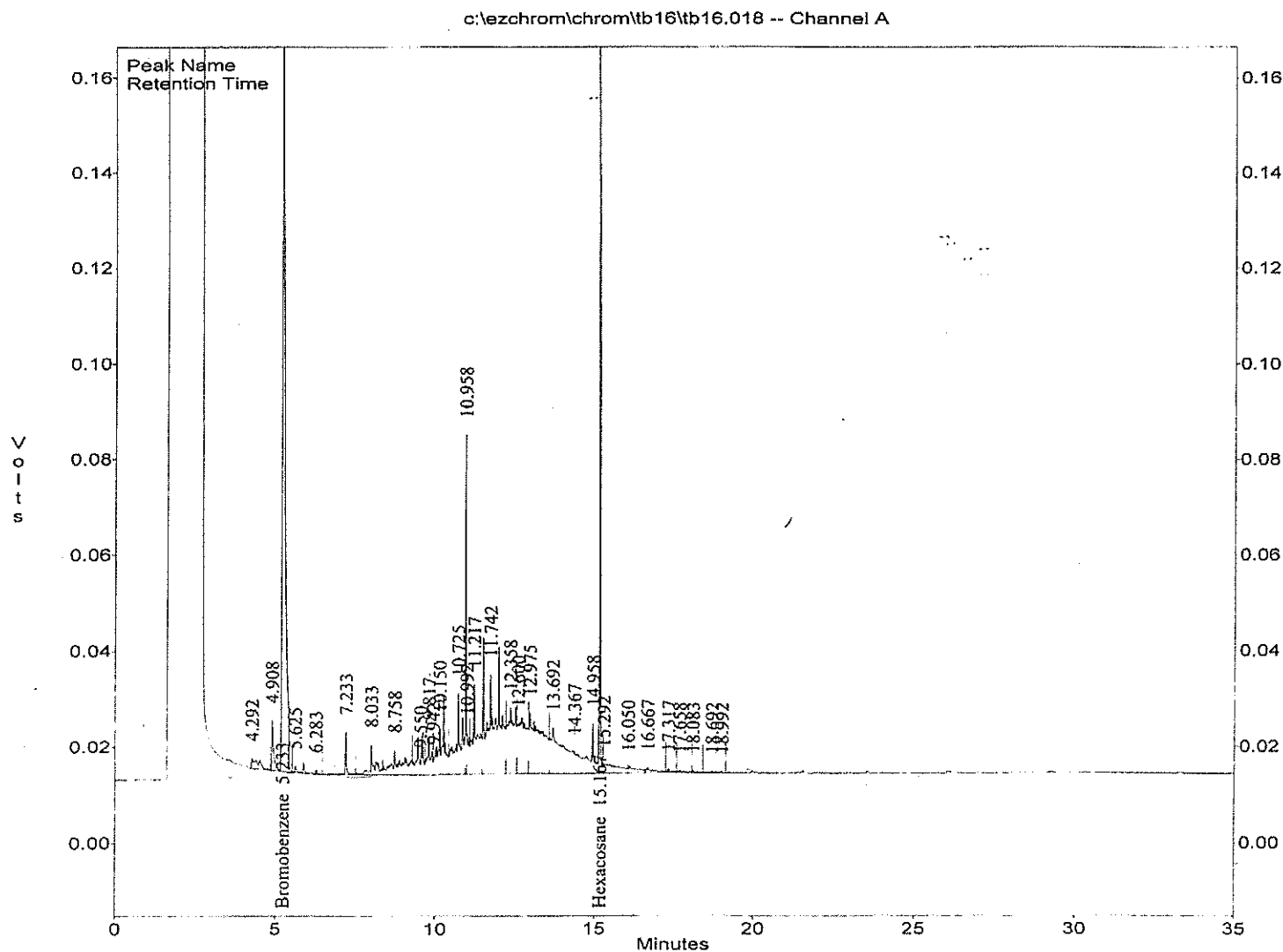
RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

SPLP Extraction: 02/13/06 18:00

File : c:\ezchrom\chrom\tb16\tb16.018
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06B050-02
Acquired : Feb 16, 2006 22:27:57
Printed : Feb 17, 2006 13:55:44
User : JANE

Channel A Results

#	Peak Name	Ret. Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
3	Bromobenzene	5.233	930313	14214.3	65.4
24	Hexacosane	15.167	478653	28984.5	16.5
G1	Diesel (TOTAL)		2913896	26500.7	110.0
G2	Diesel (C10-C24)		2667508	26460.6	100.8
G3	Diesel (C10-C28)		2798229	26478.8	105.7



5005

METHOD 1312/3520C/8015B
SPLP TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 068050A                     Date Extracted: 02/15/06 19:00
Sample ID   : 0004-085                     Date Analyzed: 02/16/06 23:09
Lab Samp ID : B050-04                       Dilution Factor: 1
Lab File ID : TB16019A                     Matrix          : WATER
Ext Btch ID : DSB029W                       % Moisture       : NA
Calib. Ref. : TB16014A                     Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	.82	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	54*	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

SPLP Extraction: 02/13/06 18:00

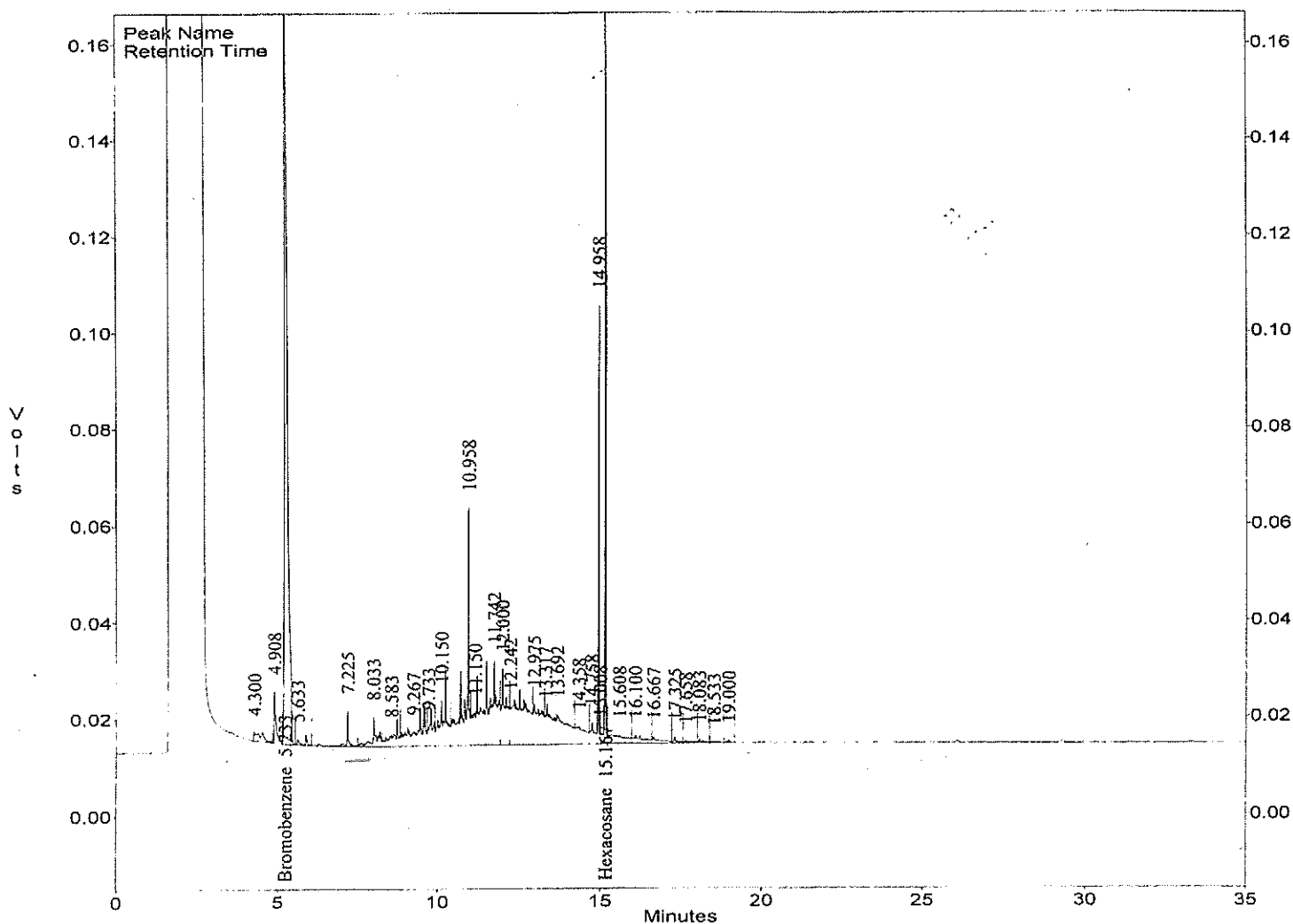
* : Out of QC limit due to matrix interference

File : c:\ezchrom\chrom\tb16\tb16.019
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06B050-04
Acquired : Feb 16, 2006 23:09:50
Printed : Feb 17, 2006 13:54:14
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
3	Bromobenzene	5.233	1055615	14214.3	74.3
23	Hexacosane	15.167	391874	28984.5	13.5
G1	Diesel (TOTAL)		2587245	26500.7	97.6
G2	Diesel (C10-C24)		2172525	26460.6	82.1
G3	Diesel (C10-C28)		2462843	26478.8	93.0

c:\ezchrom\chrom\tb16\tb16.019 -- Channel A



5007

METHOD 1312/3520C/8015B
SPLP TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/07/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/07/06
Batch No.   : 068050A                      Date Extracted: 02/15/06 19:00
Sample ID   : 0004-089                     Date Analyzed: 02/16/06 23:51
Lab Samp ID : 8050-08                      Dilution Factor: 1
Lab File ID : TB16020A                     Matrix          : WATER
Ext Btch ID : DSB029W                      % Moisture      : NA
Calib. Ref. : TB16014A                     Instrument ID   : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	1.8	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	62*	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

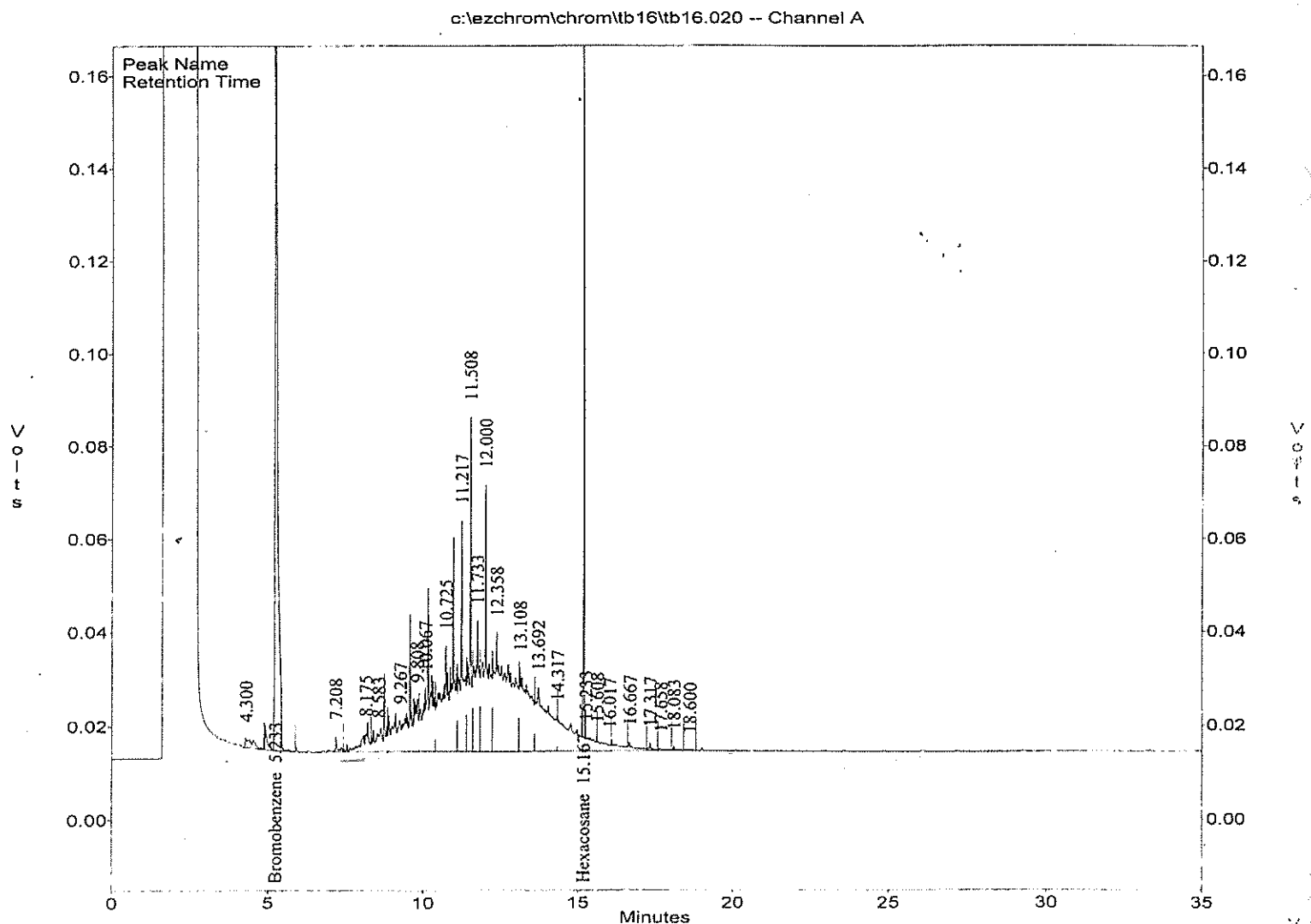
SPLP Extraction: 02/13/06 18:00

* : Out of QC limit due to matrix interference

File : c:\ezchrom\chrom\tb16\tb16.020
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06B050-08
Acquired : Feb 16, 2006 23:51:41
Printed : Feb 17, 2006 13:54:49
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
2	Bromobenzene	5.233	1020342	14214.3	71.8
18	Hexacosane	15.167	451208	28984.5	15.6
G1	Diesel (TOTAL)		4772251	26500.7	180.1
G2	Diesel (C10-C24)		4653086	26460.6	175.8
G3	Diesel (C10-C28)		4688667	26478.8	177.1



5009

QC SUMMARIES

METHOD 1312/3520C/8015B
SPLP TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client       : SES-TECH                      Date Collected: NA
Project      : CAMP PENDLETON, UST SITE 14131 Date Received: 02/15/06
Batch No.    : 06B050A                      Date Extracted: 02/15/06 19:00
Sample ID    : MBLK1W                       Date Analyzed: 02/16/06 15:28
Lab Samp ID  : DSB029WB                     Dilution Factor: 1
Lab File ID  : TB16008A                     Matrix          : WATER
Ext Btch ID  : DSB029W                      % Moisture       : NA
Calib. Ref.  : TB16002A                     Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	112	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
CH NO.: 068050A
/HOD: METHOD 1312/3520C/8015B

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: DSB029WB DSB029WL DSB029WC
LAB FILE ID: TB16008A TB16016A TB16017A
DATE EXTRACTED: 02/15/0619:00 02/15/0619:00 02/15/0619:00 DATE COLLECTED: NA
DATE ANALYZED: 02/16/0615:28 02/16/0621:04 02/16/0621:46 DATE RECEIVED: 02/15/06
PREP. BATCH: DSB029W DSB029W DSB029W
CALIB. REF: TB16002A ✓ TB16014A ✓ TB16014A ✓

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Diesel	ND	5	4.53	91	5	4.62	92	2	65-135	30

SURROGATE PARAMETER	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	QC LIMIT (%)
Hexacosane	.25	.288	115	.25	.287	115	65-135

METHOD 1312/3520C/8015B
SPLP TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```
=====
Client       : SES-TECH                      Date Collected: NA
Project      : CAMP PENDLETON, UST SITE 14131 Date Received: 02/15/06
Batch No.    : 06B050A                      Date Extracted: 02/15/06 19:00
Sample ID    : MBLK1S                       Date Analyzed: 02/16/06 18:58
Lab Samp ID  : SPB003SB                     Dilution Factor: 1
Lab File ID  : TB16013A                     Matrix          : WATER
Ext Btch ID  : DSB029W                      % Moisture       : NA
Calib. Ref.  : TB16002A                     Instrument ID    : GCT050
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.1	.025

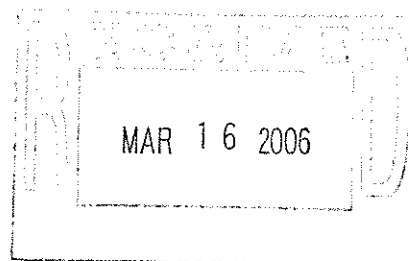
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	106	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

SPLP Extraction: 02/13/06 18:00

COPY

TABLE OF CONTENTS



CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG: 06B158

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GC/MS-SVOA	**	3000 –
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GC-SVOA	METHOD 3550B\8015B	5000 – 5028
HPLC	**	6000 –
METALS	**	7000 –
WET	**	8000 –
OTHERS	**	9000 –

** - Not Requested



LABORATORIES, INC.

1835 W. 205th Street
Torrance, CA 90501

Tel: (310) 618-8889

Fax: (310) 618-0818

Date: 02-24-2006

EMAX Batch No.: 06B158

Attn: Nick Weinberger

SES-TECH

1940 E. Deere Avenue, Suite 200
Santa Ana CA 92705

Subject: Laboratory Report

Project: Camp Pendleton, UST Site 14131

Enclosed is the Laboratory report for samples received on 02/21/06.
The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
0004-103	B158-01	02/21/06	SOIL	TPH DIESEL
0004-104	B158-02	02/21/06	SOIL	TPH DIESEL
0004-105	B158-03	02/21/06	SOIL	TPH DIESEL

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,

Kam Y. Pang, Ph.D.
Laboratory Director

NUMBER

04970

CHAIN-OF-CUSTODY RECORD

PROJECT NAME Camp Pendleton		PURCHASE ORDER NO.		ANALYSES REQUIRED				LABORATORY NAME EMAX		Project Information Section Do not submit to Laboratory					
PROJECT LOCATION DST site 14131		PROJECT NO. 2973-0040		<div>LABORATORY ID (FOR LABORATORY) 06B158</div>				COMMENTS		LOCATION		DEPTH		QC	
SAMPLER NAME Wendy Bryant		SAMPLER SIGNATURE								START		END			
PROJECT CONTACT Nick Wendt		AIRBILL NUMBER		LABORATORY INSTRUCTIONS/COMMENTS had samples for possible SPLP extension.						MW7		17		18	
SAMPLE ID		DATE COLLECTED								TIME COLLECTED		NO. OF CONTAINER		LEVEL	
0004-103		2/2/06		0812		Z		X		S		48		48	
1104-104		2/2/06		0817		Z		X		S		48		48	
0004-105		2/2/06		0822		Z		X		S		48		48	
RELINQUISHED BY (Signature)		DATE		RECEIVED BY (Signature)		DATE		LABORATORY INSTRUCTIONS/COMMENTS		SAMPLING COMMENT:					
COMPANY		TIME		COMPANY		TIME		COMPOSITE DESCRIPTION							
RELINQUISHED BY (Signature)		DATE		RECEIVED BY (Signature)		DATE		SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)							
COMPANY		TIME		COMPANY		TIME		TEMPERATURE: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN							
RELINQUISHED BY (Signature)		DATE		RECEIVED BY (Signature)		DATE		COOLER SEAL: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN							
COMPANY		TIME		COMPANY		TIME									

C7

NUMBER 04970

06B158

CHAIN-OF-CUSTODY RECORD

PROJECT NAME		PURCHASE ORDER NO.		ANALYSES REQUIRED		LABORATORY NAME	
PROJECT LOCATION		PROJECT NO.		LABORATORY ID (FOR LABORATORY)		COMMENTS	
Camp Pendleton		2973.0040		EMAX			
1230 Site 14131		SAMPLER SIGNATURE		06B158			
Wendy Bryant		AIRBILL NUMBER					
Nick Weinberger		CARRIER					
SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL	T Y P E	T A T	
10004-103	2/1/06	0812	2	X	SW	48	X
20004-104	2/1/06	0817	2	X	SW	48	X
30004-105	2/1/06	0822	2	X	SW	48	X
<div style="display: flex; justify-content: space-around;"> <div> <p>RECEIVED BY (Signature)</p> <p>DATE 2/1/06</p> <p>TIME 1300</p> <p>COMPANY EMAX</p> </div> <div> <p>RECEIVED BY (Signature)</p> <p>DATE 2/1/06</p> <p>TIME 1650</p> <p>COMPANY EMAX</p> </div> </div>							
LABORATORY INSTRUCTIONS/COMMENTS							
had samples for possible SPUP extraction							
COMPOSITE DESCRIPTION							
SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)							
TEMPERATURE: 3.5°C SAMPLE CONDITION: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN							
COOLER SEAL: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN							

1002

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14131

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

SDG#: 06B158

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG: 06B158

METHOD 3550B/8015B TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Three (3) soil samples were received on 02/21/06 for Total Petroleum Hydrocarbons by Extraction analysis by Method 3550B/8015B in accordance with SW846 3RD Edition.

1. **Holding Time**

Analytical holding time was met. Extraction was performed and completed on 02/22/06.

2. **Calibration**

Initial calibration was seven points for Diesel. %RSDs were within 20%. Continuing calibrations were carried out within 12-hour intervals and all recoveries were within 85-115%.

3. **Method Blank**

Method blank was free of contamination at half of the reporting limit.

4. **Surrogate Recovery**

All recoveries were within QC limits.

5. **Lab Control Sample**

All recoveries were within QC limits.

6. **Matrix Spike/Matrix Spike Duplicate**

No sample was designated for MS/MSD.

7. **Sample Analysis**

Samples were analyzed according to the prescribed QC procedures. All criteria were met. Sample results were quantitated from C10 to C24 using Diesel (C10-C24) calibration factor.

Sample B158-01 displayed diesel-like fuel pattern.

LAB CHRONICLE
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14131
SDG NO. : 068158
Instrument ID : GCT050

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	SOIL		Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
				Analysis DateTime	DateTime					
MBLK1S	DSB036SB	1	NA	02/23/0606:03	02/22/0615:45	TB21056A	TB21052A	DSB036S	Method Blank	
LCS1S	DSB036SL	1	NA	02/23/0606:45	02/22/0615:45	TB21057A	TB21052A	DSB036S	Lab Control Sample (LCS)	
0004-103	B158-01	1	14.6	02/23/0607:26	02/22/0615:45	TB21058A	TB21052A	DSB036S	Field Sample	
0004-104	B158-02	1	15.4	02/23/0608:08	02/22/0615:45	TB21059A	TB21052A	DSB036S	Field Sample	
0004-105	B158-03	1	15.3	02/23/0608:50	02/22/0615:45	TB21060A	TB21052A	DSB036S	Field Sample	

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/21/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/21/06
Batch No.   : 06B158                       Date Extracted: 02/22/06 15:45
Sample ID   : 0004-103                     Date Analyzed: 02/23/06 07:26
Lab Samp ID : 8158-01                      Dilution Factor: 1
Lab File ID : TB21058A                     Matrix       : SOIL
Ext Btch ID : DSB036S                      % Moisture    : 14.6
Calib. Ref. : TB21052A                     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	260	12	5.9

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	124	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

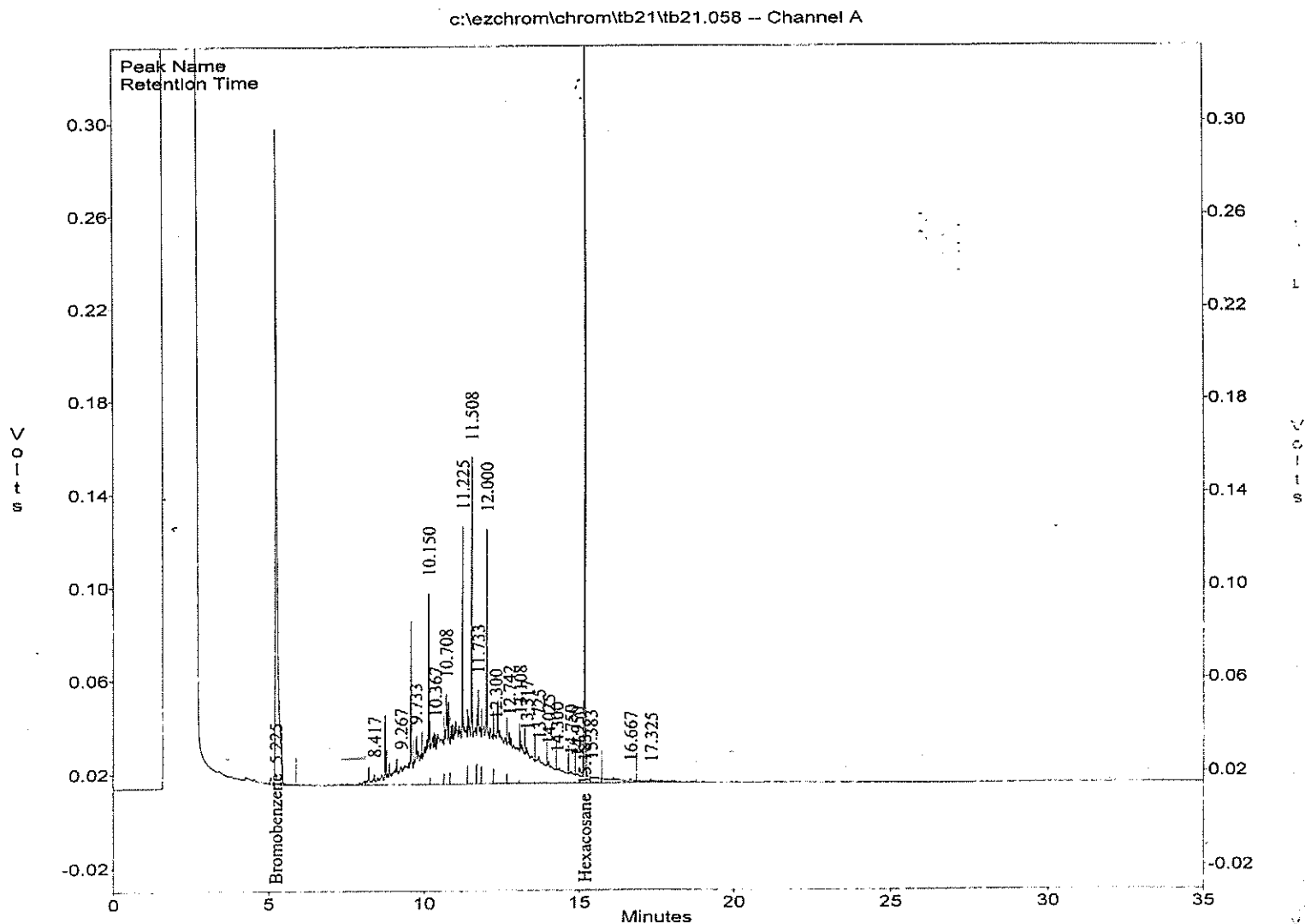
METHOD 8015 by GC/FID
EMAX Analytical Laboratories, Inc.

SUN 7-8-07
LABORATORIES, INC.

File : c:\ezchrom\chrom\tb21\tb21.058
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06B158-01
Acquired : Feb 23, 2006 07:26:51
Printed : Feb 23, 2006 09:35:13
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.225	1137183	14214.3	80.0
21	Hexacosane	15.183	898311	28984.5	31.0
G1	Diesel (TOTAL)		5999493	26500.7	226.4
G2	Diesel (C10-C24)		5862177	26460.6	221.5
G3	Diesel (C10-C28)		5962333	26478.8	225.2



5005

22.22.a

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/21/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/21/06
Batch No.   : 06B158                      Date Extracted: 02/22/06 15:45
Sample ID   : 0004-104                    Date Analyzed: 02/23/06 08:08
Lab Samp ID : B158-02                     Dilution Factor: 1
Lab File ID : TB21059A                    Matrix       : SOIL
Ext Btch ID : OSB036S                     % Moisture    : 15.4
Calib. Ref. : TB21052A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	12	5.9

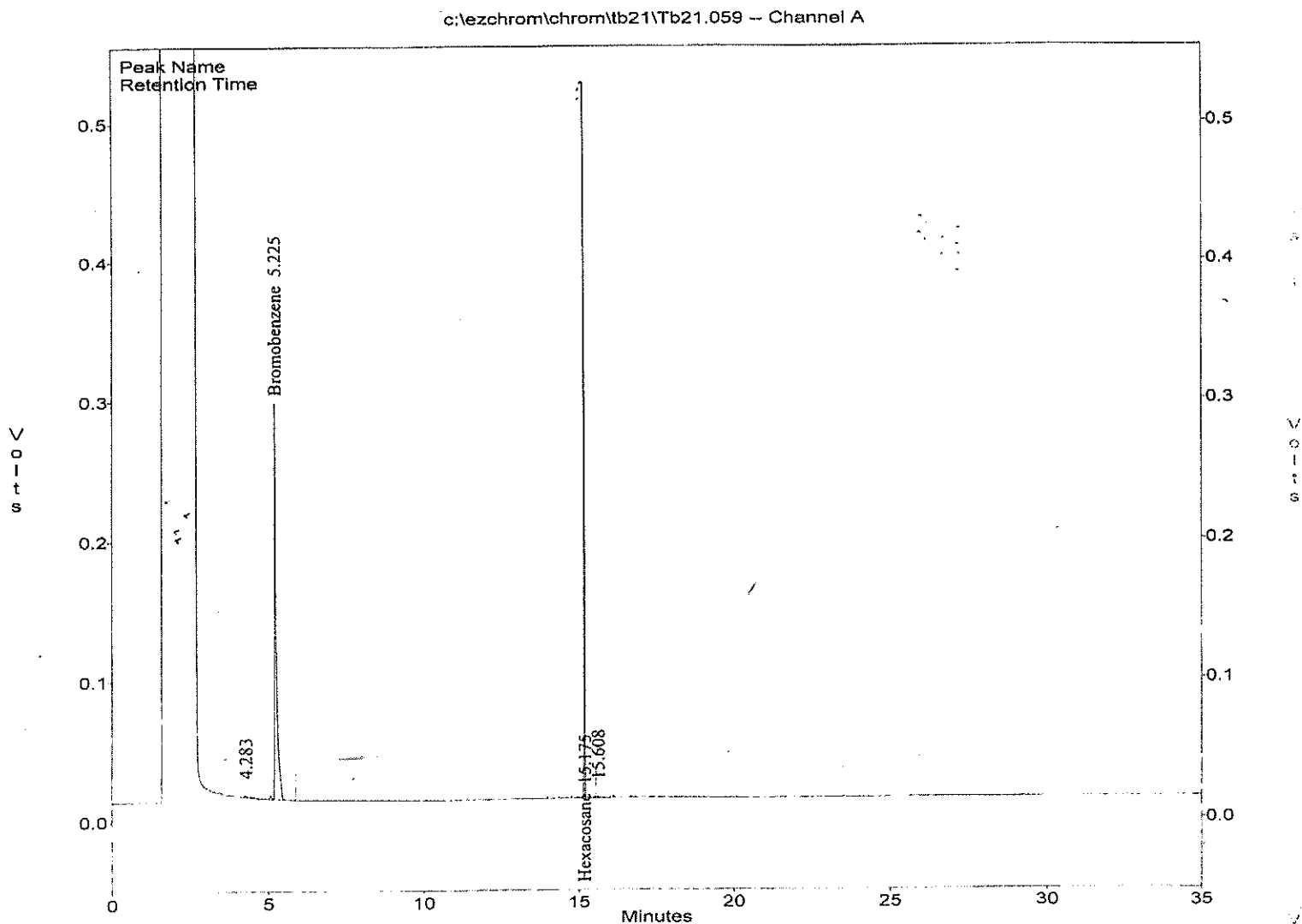
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	123	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tb21\tb21.059
Method : c:\ezchrom\methods\Ds50a31.met
Sample ID : 06B158-02
Acquired : Feb 23, 2006 08:08:31
Printed : Feb 23, 2006 08:43:32
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
2	Bromobenzene	5.225	1111038	14214.3	78.2
3	Hexacosane	15.175	888155	28984.5	30.6
G1	Diesel (TOTAL)		22341	26500.7	0.8
G2	Diesel (C10-C24)		0	26460.6	0.0
G3	Diesel (C10-C28)		0	26478.8	0.0



5007

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/21/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/21/06
Batch No.   : 06B158                      Date Extracted: 02/22/06 15:45
Sample ID   : 0004-105                    Date Analyzed: 02/23/06 08:50
Lab Samp ID : B158-03                     Dilution Factor: 1
Lab File ID : TB21060A                    Matrix       : SOIL
Ext Btch ID : DSB036S                     % Moisture    : 15.3
Calib. Ref. : TB21052A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	12	5.9

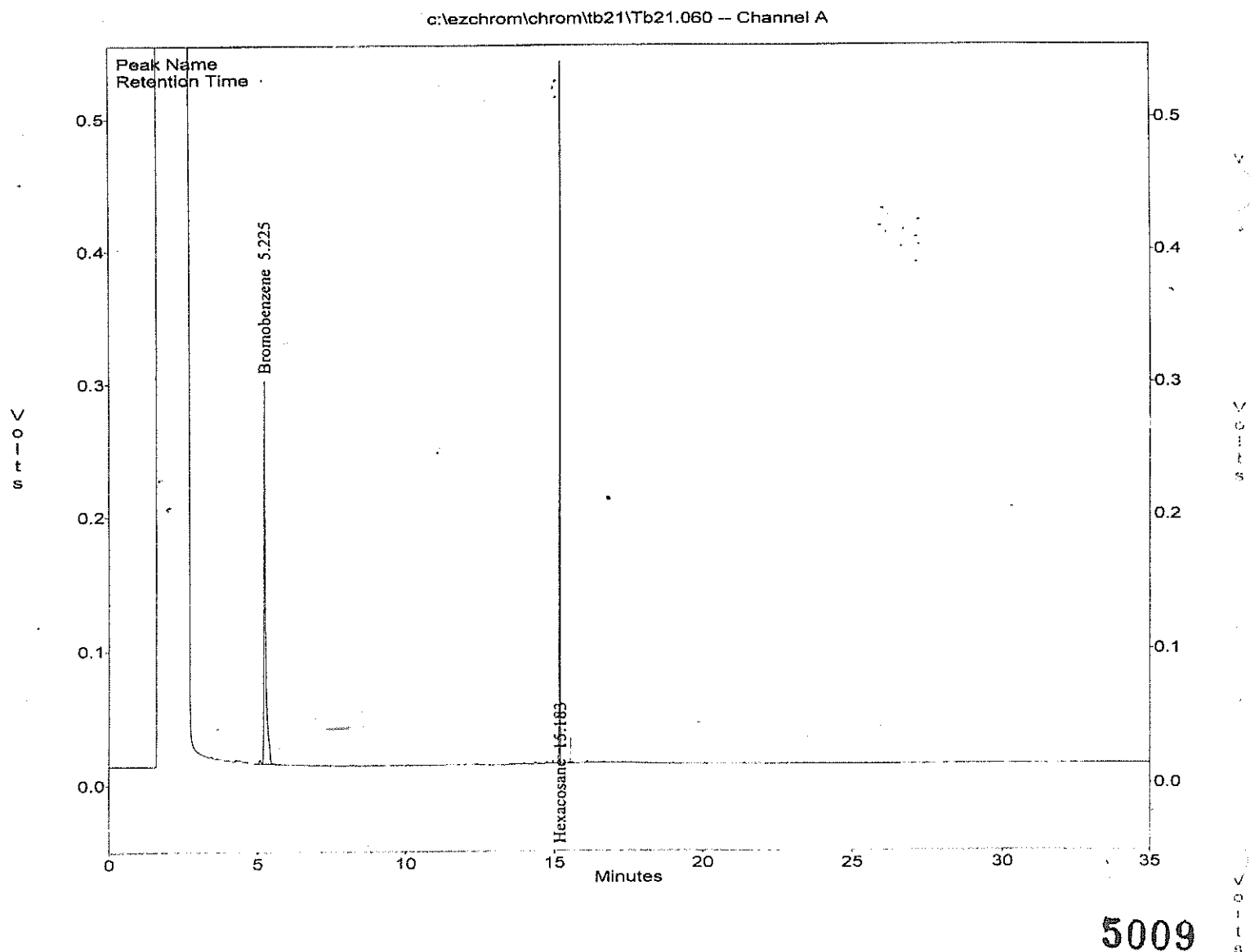
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	123	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tb21\Tb21.060
Method : c:\ezchrom\methods\Ds50a31.met
Sample ID : 06B158-03
Acquired : Feb 23, 2006 08:50:12
Printed : Feb 23, 2006 09:25:13
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.225	1137885	14214.3	80.1
2	Hexacosane	15.183	888950	28984.5	30.7
G1	Diesel (TOTAL)		0	26500.7	0.0
G2	Diesel (C10-C24)		0	26460.6	0.0
G3	Diesel (C10-C28)		0	26478.8	0.0



QC SUMMARIES

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: NA
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 02/22/06
Batch No.   : 06B158                      Date Extracted: 02/22/06 15:45
Sample ID   : MBLK1S                      Date Analyzed: 02/23/06 06:03
Lab Samp ID : DSB036SB                   Dilution Factor: 1
Lab File ID : TB21056A                   Matrix       : SOIL
Ext Btch ID : DSB036S                   % Moisture    : NA
Calib. Ref. : TB21052A                   Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	10	5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	126	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
ATCH NO.: 06B158
ETHOD: METHOD 3550B/8015B

MATRIX: SOIL % MOISTURE: NA
DILUTION FACTOR: 1
SAMPLE ID: MBLK1S
LAB SAMP ID: DSB036SB DSB036SL
LAB FILE ID: TB21056A TB21057A
DATE EXTRACTED: 02/22/0615:45 02/22/0615:45 DATE COLLECTED: NA
DATE ANALYZED: 02/23/0606:03 02/23/0606:45 DATE RECEIVED: 02/22/06
PREP. BATCH: DSB036S DSB036S
CALIB. REF: TB21052A TB21052A ✓

ACCESSION:

PARAMETER	BLNK RSLT (mg/kg)	SPIKE AMT (mg/kg)	BS RSLT (mg/kg)	BS % REC	QC LIMIT (%)
Diesel	ND	500	508	102	65-135

SURROGATE PARAMETER	SPIKE AMT (mg/kg)	BS RSLT (mg/kg)	BS % REC	QC LIMIT (%)
Hexacosane	25	32	128	65-135

Culture Analysis Report

Client: Nick Weinberger
Tetra Tech, Inc.
1940 East Deere Ave
Suite 200
Santa Ana, CA 92705

Phone: (949) 756-7588

Fax: (949) 756-7583

MI Identifier: 021DB

Date Rec: 02/08/2006

Report Date: 02/23/2006

Client Project #: 2973.0040

Client Project Name: Camp Pendleton

Purchase Order #: TBD

Analysis Requested: Plate Count

Comments: The total heterotrophic plate counts and petroleum (diesel) degrader plate counts were analyzed at 14 days.

All samples within this data package were analyzed under U.S. EPA Good Laboratory Practice Standards: Toxic Substances Control Act (40 CFR part 790). All samples were processed according to standard operating procedures. Test results submitted in this data package meet the quality assurance requirements established by Microbial Insights, Inc.

Reported By:



Reviewed By:



NOTICE: This report is intended only for the addressee shown above and may contain confidential or privileged information. If the recipient of this material is not the intended recipient or if you have received this in error, please notify Microbial Insights, Inc. immediately. The data and other information in this report represent only the sample(s) analyzed and are rendered upon condition that it is not to be reproduced without approval from Microbial Insights, Inc. Thank you for your cooperation.

MICROBIAL INSIGHTS, INC.

2340 Stock Creek Blvd. Rockford, TN 37853-3044
Tel: (865) 573-8188; Fax: (865) 573-8133

CULTURE REPORT

Client: Tetra Tech, Inc.
Project: Camp Pendleton

MI Project Number: 021DB
Date Received: 02/08/2006

Sample Information

Client Sample ID: 0004-091
Sample Date: 02/07/2006

Bacterial Group

Aerobic Heterotrophs	9215m	cfu/g	4.1E+03
95% LL		cfu/g	2.14E+03
95% UL		cfu/g	6.06E+03

Contaminant Utilizing

Diesel Oxidizing Bacteria	9215m	cfu/g	3.65E+03
95% LL		cfu/g	3.36E+03
95% UL		cfu/g	3.94E+03

Legend:

NA = Not Analyzed NS = Not Sampled LL = 95% confidence lower limit UL = 95% confidence upper limit NG = no growth

BACKFILL MATERIAL ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION



TETRA TECH
1238 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-1696

CHAIN-OF-CUSTODY RECORD

NUMBER
12445

06A078

22

[illegible]

White - Laboratory: Pink - Laboratory: Canary - Descent Estate: Mobile: Date: 11-----

Packaging Inspection			
Container	<input type="checkbox"/> Cooler	<input type="checkbox"/> Box	<input type="checkbox"/>
Condition	<input type="checkbox"/> Custody Seal	<input type="checkbox"/> Intact	<input type="checkbox"/>
Packaging	<input type="checkbox"/> Bubble Pack	<input type="checkbox"/> Styrofoam	<input type="checkbox"/>
Temperatures	<input checked="" type="checkbox"/> Cooler 1 <u>2.9°C</u>	<input checked="" type="checkbox"/> Cooler 2 _____	<input checked="" type="checkbox"/> <u>Plastic Bag</u>
	<input type="checkbox"/> Cooler 5 _____	<input type="checkbox"/> Cooler 6 _____	<input type="checkbox"/> Cooler 4 _____
	<input type="checkbox"/> Cooler 9 _____	<input type="checkbox"/> Cooler 10 _____	<input type="checkbox"/> Cooler 8 _____
Comments:			<input type="checkbox"/> Cooler 12 _____
			<input type="checkbox"/> Cooler 3 _____
			<input type="checkbox"/> Cooler 7 _____
			<input type="checkbox"/> Damaged
			<input type="checkbox"/> Sufficient
			<input type="checkbox"/>

[illegible]

LSCID : Lab Sample Container ID

REVIEWS

Sample Labeling

Date /

SRF

Date _____

PM

Date _____

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14131

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

SDG#: 06A078

5000

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG: 06A078

METHOD 3550B/8015B TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Two (2) soil samples were received on 01/17/06 for Total Petroleum Hydrocarbons by Extraction analysis by Method 3520C/8015B in accordance with SW846 3RD Edition.

1. Holding Time

Analytical holding time was met. Extraction was performed and completed on 01/18/06.

2. Calibration

Initial calibration was seven points for Diesel. %RSDs were within 20%. Continuing calibrations were carried out at 12-hour intervals and all recoveries were within 85-115%.

3. Method Blank

Method blank was free of contamination at half of the reporting limit.

4. Surrogate Recovery

All recoveries were within QC limits.

5. Lab Control Sample/Lab Control Sample Duplicate

All recoveries were within QC limits.

6. Matrix Spike/Matrix Spike Duplicate

No sample was designated for MS/MSD.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met. Sample results were quantitated from C10 to C24 using Diesel (C10-C24) calibration factor.

Sample A078-02 displayed motor oil-like fuel pattern.

SAMPLE RESULTS

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
nt      : SES-TECH                      Date Collected: 01/17/06
ct      : CAMP PENDLETON, UST SITE 14131 Date Received: 01/17/06
atch No. : 06A078                      Date Extracted: 01/18/06 10:45
Sample ID: 0004-072                     Date Analyzed: 01/20/06 20:42
Lab Samp ID: A078-01                    Dilution Factor: 1
Lab File ID: TA19045A                   Matrix      : SOIL
Ext Btch ID: DSA016S                    % Moisture   : 10.7
Calib. Ref.: TA19039A                   Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	11	5.6

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	71	65-135

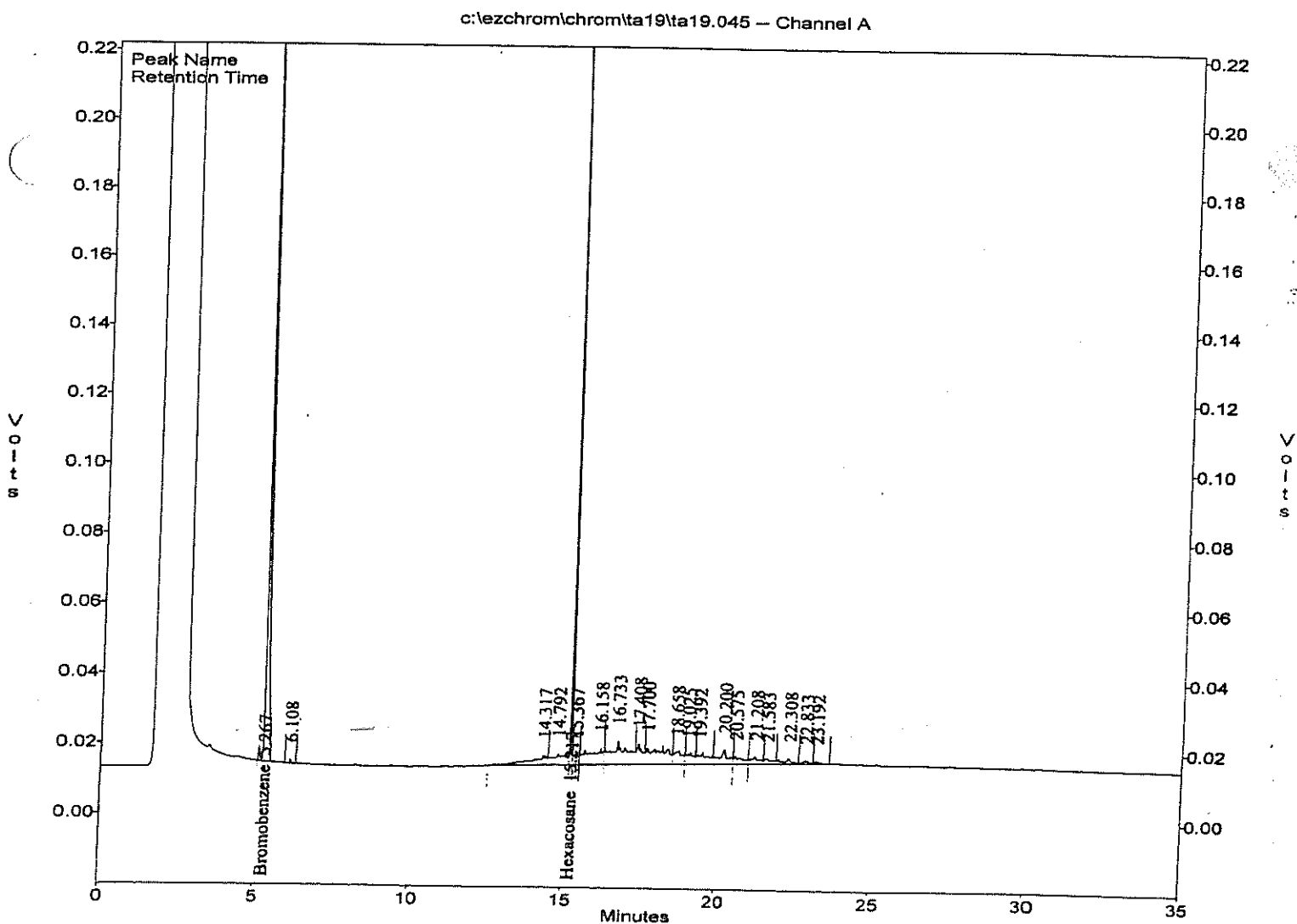
RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 8015 by GC/FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\ta19\ta19.045
Method : c:\ezchrom\methods\ds50a19.met
Sample ID : 06A078-01
Acquired : Jan 20, 2006 20:42:52
Printed : Jan 23, 2006 09:45:22
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
1	Bromobenzene	5.267	1140070	19748.8	57.7
5	Hexacosane	15.217	694679	38991.6	17.8
G1	Diesel (TOTAL)		1324404	25335.2	52.3
G2	Diesel (C10-C24)		112783	25208.3	4.5
G3	Diesel (C10-C28)		359154	25218.1	14.2



5005

QC SUMMARIES

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: NA
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 01/18/06
Batch No.   : 06A078                       Date Extracted: 01/18/06 10:45
Sample ID   : MBLK1S                       Date Analyzed: 01/20/06 20:01
Lab Samp ID : DSA016SB                     Dilution Factor: 1
Lab File ID : TA19044A                     Matrix       : SOIL
Ext Btch ID : DSA016S                      % Moisture    : NA
Calib. Ref. : TA19039A                     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	10	5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	71	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: SES-TECH
EFFECT: CAMP PENDLETON, UST SITE 14131
ID NO.: 06A078
METHOD: METHOD 3550B/8015B

MATRIX: SOIL
DILUTION FACTOR: 1 1 1 % MOISTURE: NA
SAMPLE ID: MBLK1S
LAB SAMP ID: DSA016SB DSA016SL DSA016SC
LAB FILE ID: TA19044A TA19042A TA19043A
DATE EXTRACTED: 01/18/0610:45 01/18/0610:45 01/18/0610:45 DATE COLLECTED: NA
DATE ANALYZED: 01/20/0620:01 01/20/0618:37 01/20/0619:19 DATE RECEIVED: 01/18/06
PREP. BATCH: DSA016S DSA016S DSA016S
CALIB. REF: TA19039A TA19039A TA19039A

ACCESSION:

PARAMETER	BLNK RSLT (mg/kg)	SPIKE AMT (mg/kg)	BS RSLT (mg/kg)	BS % REC	SPIKE AMT (mg/kg)	BSD RSLT (mg/kg)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Diesel	ND	500	529	106	500	548	110	4	65-135	35

SURROGATE PARAMETER	SPIKE AMT (mg/kg)	BS RSLT (mg/kg)	BS % REC	SPIKE AMT (mg/kg)	BSD RSLT (mg/kg)	BSD % REC	QC LIMIT (%)
Hexacosane	25	16.9	68	25	18	72	65-135

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14131

METALS BY ICP/MERCURY

SDG#: 06A078

7000

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG: 06A078

**METHOD 3050B/6010B
METALS BY ICP**

Two (2) soil samples were received on 01/17/06 for Metals analysis by Method 3050B/6010B in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at half of the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample A078-01 was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

METHOD 3050B/6010B
METALS BY ICP

```

=====
t      : SES-TECH      Date Collected: 01/17/06
Project : CAMP PENDLETON, UST SITE 14131 Date Received: 01/17/06
SDG NO. : 06A078      Date Extracted: 01/18/06 09:30
Sample ID: 0004-072    Date Analyzed: 01/19/06 19:48
Lab Samp ID: A078-01   Dilution Factor: 1
Lab File ID: I73A020015 Matrix      : SOIL
Ext Btch ID: IPA026S   % Moisture  : 10.7
Calib. Ref.: I73A020009 Instrument ID : EMAXTI73
=====

```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	ND	11.2	2.24
Arsenic	2.07	1.12	.448
Barium	92.2	1.12	.224
Beryllium	.402J	1.12	.224
Cadmium	.225J	1.12	.112
Chromium	23.5	1.12	.224
Cobalt	5.78	1.12	.224
Copper	17.7	1.12	.224
Lead	7.39	1.12	.224
Molybdenum	1.15J	5.6	.56
Nickel	16.1	2.24	.224
Selenium	.784J	1.12	.56
Silver	.624J	1.12	.28
Thallium	7.23	1.12	.56
Vanadium	33.1	1.12	.56
Zinc	49.2	1.12	.56

7003

METHOD 3050B/6010B
METALS BY ICP

Site : SES-TECH
 Site : CAMP PENDLETON, UST SITE 14131
 NO. : 06A078
 Sample ID: MBLK1S
 Lab Samp ID: IPA026SB
 Lab File ID: I73A021012
 Ext Btch ID: IPA026S
 Calib. Ref.: I73A021009
 Date Collected: NA
 Date Received: 01/18/06
 Date Extracted: 01/18/06 09:30
 Date Analyzed: 01/20/06 14:15
 Dilution Factor: 1
 Matrix : SOIL
 % Moisture : NA
 Instrument ID : EMAXTI73

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	ND	10	.2
Arsenic	ND	1	.4
Barium	ND	1	.2
Beryllium	ND	1	.2
Cadmium	ND	1	.1
Chromium	ND	1	.2
Cobalt	ND	1	.2
Copper	ND	1	.2
Lead	ND	1	.2
Molybdenum	ND	5	.5
Nickel	ND	2	.2
Selenium	ND	1	.5
Silver	ND	1	.25
Thallium	ND	1	.5
Vanadium	ND	1	.5
Zinc	ND	1	.5

7005

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
O.: 06A078
METHOD: METHOD 3050B/6010B

MATRIX: SOIL
DILTN FACTR: 1 1 1 % MOISTURE: NA
SAMPLE ID: MBLK1S
CONTROL NO.: IPA026SB IPA026SL IPA026SC
LAB FILE ID: I73A021012 I73A020012 I73A020013
DATE TIME EXTRACTD: 01/18/0609:30 01/18/0609:30 01/18/0609:30 DATE COLLECTED: NA
DATE TIME ANALYZD: 01/20/0614:15 01/19/0619:27 01/19/0619:34 DATE RECEIVED: 01/18/06
PREP. BATCH: IPA026S IPA026S IPA026S
CALIB. REF: I73A021009 I73A020009 I73A020009

ACCESSION:

PARAMETER	BLNK RSLT mg/kg	SPIKE AMT mg/kg	BS RSLT mg/kg	BS % REC	SPIKE AMT mg/kg	BSD RSLT mg/kg	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Antimony	ND	500	482	96	500	481	96	0	75-125	25
Arsenic	ND	100	98.6	99	100	98.4	98	0	75-125	25
Barium	ND	100	94.6	95	100	94.4	94	0	75-125	25
Beryllium	ND	100	99.8	100	100	99.9	100	0	75-125	25
Cadmium	ND	100	93.1	93	100	93.2	93	0	75-125	25
Chromium	ND	100	97.7	98	100	97.7	98	0	75-125	25
Cobalt	ND	100	94.3	94	100	94.4	94	0	75-125	25
Copper	ND	100	101	101	100	101	101	0	75-125	25
Lead	ND	100	95.3	95	100	95.6	96	0	75-125	25
Molybdenum	ND	100	98	98	100	98.1	98	0	75-125	25
Nickel	ND	100	93.4	93	100	93.6	94	0	75-125	25
Selenium	ND	100	92.7	93	100	93.2	93	0	75-125	25
Silver	ND	100	97.4	97	100	97.2	97	0	75-125	25
Thallium	ND	100	97.3	97	100	97.1	97	0	75-125	25
Vanadium	ND	100	99.7	100	100	99.7	100	0	75-125	25
Zinc	ND	100	96.8	97	100	96.9	97	0	75-125	25

7006

EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
BATCH NO.: 06A078
METHOD: METHOD 3050B/6010B

MATRIX: SOIL % MOISTURE: 10.7
DILUTION FACTOR: 1 5
SAMPLE ID: 0004-072 0004-072DL
EMAX SAMP ID: A078-01 A078-01J
LAB FILE ID: I73A020015 I73A020016
DATE EXTRACTED: 01/18/0609:30 01/18/0609:30 DATE COLLECTED: 01/17/06
DATE ANALYZED: 01/19/0619:48 01/19/0619:54 DATE RECEIVED: 01/17/06
PREP. BATCH: IPA026S IPA026S
CALIB. REF: I73A020009 I73A020009

ACCESSION:

PARAMETER	SMPL RSLT (mg/kg)	SERIAL DIL RSLT (mg/kg)	DIF RSLT %	QC LIMIT (%)
Antimony	ND	ND	0	10
Arsenic	2.07	2.79J	NA	10
Barium	92.2	96.9	5	10
Beryllium	.402J	ND	NA	10
Cadmium	.225J	ND	NA	10
Chromium	23.5	24.5	4	10
Cobalt	5.78	6.11	6	10
Copper	17.7	16.9	5	10
Lead	7.39	8.22	11*	10
Molybdenum	1.15J	ND	NA	10
Nickel	16.1	17	6	10
Selenium	.784J	3.65J	NA	10
Silver	.624J	ND	NA	10
Thallium	7.23	8.82	22*	10
Vanadium	33.1	33.9	2	10
Zinc	49.2	54.3	10	10

7007

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG NO.: 06A078
METHOD: METHOD 3050B/60108

MATRIX: SOIL % MOISTURE: 10.7
DILTN FACTR: 1
SAMPLE ID: 0004-072
CONTROL NO.: A078-01 A078-01A
LAB FILE ID: I73A020015 I73A020014
DATIME EXTRCTD: 01/18/0609:30 01/18/0609:30 DATE COLLECTED: 01/17/06
DATIME ANALYZD: 01/19/0619:48 01/19/0619:40 DATE RECEIVED: 01/17/06
PREP. BATCH: IPA026S IPA026S
CALIB. REF: I73A020009 I73A020009

ACCESSION:

PARAMETER	SMPL RSLT (mg/kg)	SPIKE AMT (mg/kg)	AS RSLT (mg/kg)	AS % REC	QC LIMIT (%)
Antimony	ND	560	505	90	75-125
Arsenic	2.07	112	106	93	75-125
Barium	92.2	112	189	86	75-125
Beryllium	.402J	112	105	94	75-125
Cadmium	.225J	112	97.7	87	75-125
Chromium	23.5	112	125	91	75-125
Cobalt	5.78	112	105	88	75-125
Copper	17.7	112	127	97	75-125
Lead	7.39	112	108	90	75-125
Molybdenum	1.15J	112	104	92	75-125
Nickel	16.1	112	113	87	75-125
Selenium	.784J	112	99.5	88	75-125
Silver	.624J	112	103	91	75-125
Thallium	7.23	112	109	91	75-125
Vanadium	33.1	112	137	93	75-125
Zinc	49.2	112	149	89	75-125

7008

pl

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG: 06A078

METHOD 7471A MERCURY BY COLD VAPOR

Two (2) soil samples were received on 01/17/06 for Mercury analysis by Method 7471A in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at half of the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample A040-01 from another SDG was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

MS/MSD sample was not designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
MERCURY BY COLD VAPOR

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14131
SDG NO. : 06A078
Instrument ID : T1047

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	Extraction Date/Time	Sample Data FN	Calibration Prep. Data FN	Batch	Notes
HLK1S	HGA012SB	1	NA	01/19/0614:13	01/18/0616:00	M47A012010	M47A012008	HGA012S	Method Blank
LCS1S	HGA012SL	1	NA	01/19/0614:15	01/18/0616:00	M47A012011	M47A012008	HGA012S	Lab Control Sample (LCS)
LCD1S	HGA012SC	1	NA	01/19/0614:17	01/18/0616:00	M47A012012	M47A012008	HGA012S	LCS Duplicate
S039AS	A040-01A	1	17.4	01/19/0614:19	01/18/0616:00	M47A012013	M47A012008	HGA012S	Analytical Spike Sample
S039	A040-01	1	17.4	01/19/0614:22	01/18/0616:00	M47A012014	M47A012008	HGA012S	Field Sample
S039DL	A040-01J	5	17.4	01/19/0614:24	01/18/0616:00	M47A012015	M47A012008	HGA012S	Diluted Sample
0004-072	A078-01	1	10.7	01/19/0615:12	01/18/0616:00	M47A012038	M47A012032	HGA012S	Field Sample

FN - Filename
% Moist - Percent Moisture

METHOD : 1A
MERCURY BY COLD VAPOR

Client : SES-TECH

Project : CAMP PENDLETON, UST SITE 14131

Batch No. : 06A078

Matrix : SOIL
Instrument ID : T1047

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/kg)	DLF	MOIST	RL (mg/kg)	MDL (mg/kg)	Analysis DATETIME	Extraction DATETIME	LFID	CAL REF	PREP BATCH	Collection DATETIME	Received DATETIME
MBLK1S	HGA012SB	ND	1	NA	.1	.033	01/19/0614:13	01/18/0616:00	M47A012010	M47A012008	HGA012S	NA	01/18/06
LCS1S	HGA012SL	.832	1	NA	.1	.033	01/19/0614:15	01/18/0616:00	M47A012011	M47A012008	HGA012S	NA	01/18/06
LCD1S	HGA012SC	.813	1	NA	.1	.033	01/19/0614:17	01/18/0616:00	M47A012012	M47A012008	HGA012S	NA	01/18/06
0004-072	A078-01	ND	1	10.7	.112	.037	01/19/0615:12	01/18/0616:00	M47A012038	M47A012032	HGA012S	01/17/06	01/17/06

7021

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG NO.: 06A078
METHOD: METHOD 7471A

MATRIX: SOIL
DILTN FACTR: 1 1
SAMPLE ID: MBLK1S
CONTROL NO.: HGA012SB HGA012SL HGA012SC
LAB FILE ID: M47A012010 M47A012011 M47A012012
DATE EXTRACTD: 01/18/0616:00 01/18/0616:00 01/18/0616:00
DATE ANALYZD: 01/19/0614:13 01/19/0614:15 01/19/0614:17
PREP. BATCH: HGA012S HGA012S HGA012S
CALIB. REF: M47A012008 M47A012008 M47A012008

% MOISTURE: NA

DATE COLLECTED: NA
DATE RECEIVED: 01/18/06

ACCESSION:

PARAMETER	BLNK RSLT	SPIKE AMT	BS RSLT	BS	SPIKE AMT	BSD RSLT	BSD	RPD	QC LIMIT	MAX RPD
	mg/kg	mg/kg	mg/kg	% REC	mg/kg	mg/kg	% REC	%	%	%
Mercury	ND	.833	.832	100	.833	.813	98	2	75-125	25

EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: SES-TECH

PROJECT: CAMP PENDLETON, UST SITE 14131

BATCH NO.: 06A078

METHOD: METHOD 7471A

MATRIX: SOIL

DILUTION FACTOR: 1

SAMPLE ID: S039

EMAX SAMP ID: A040-01

LAB FILE ID: M47A012014

DATE EXTRACTED: 01/18/0616:00

DATE ANALYZED: 01/19/0614:22

PREP. BATCH: HGA012S

CALIB. REF: M47A012008

% MOISTURE: 17.4

5

S039DL

A040-01J

M47A012015

01/18/0616:00

01/19/0614:24

HGA012S

M47A012008

DATE COLLECTED: 01/09/06

DATE RECEIVED: 01/10/06

ACCESSION:

PARAMETER	SMPL RSLT (mg/kg)	SERIAL DIL RSLT (mg/kg)	DIF RSLT %	QC LIMIT (%)
Mercury	ND	ND	0	10

7023

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: SES-TECH

PROJECT: CAMP PENDLETON, UST SITE 14131

SDG NO.: 06A078

METHOD: METHOD 7471A

MATRIX: SOIL
DILTN FACTR: 1
SAMPLE ID: S039
CONTROL NO.: A040-01
LAB FILE ID: M47A012014
DATE TIME EXTRCTD: 01/18/0616:00
DATE TIME ANALYZD: 01/19/0614:22
PREP. BATCH: HGA012S
CALIB. REF: M47A012008

% MOISTURE: 17.4

DATE COLLECTED: 01/09/06

DATE RECEIVED: 01/10/06

ACCESSION:

PARAMETER	SMPL RSLT (mg/kg)	SPIKE AMT (mg/kg)	AS RSLT (mg/kg)	AS % REC	QC LIMIT (%)
Mercury	ND	.401	.353	88	85-115

7024

6

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14131

6

METHOD 9045
pH

SDG#: 06A078

8000

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, USST SITE 14131
SDG: 06A078

METHOD 9045 pH

Two (2) soil samples were received on 01/17/06 for pH analysis by Method 9045 in accordance with "Method for Chemical Analysis of Water and Wastewater", EPA 600/4-79-020 (1983).

1. Holding Time

Analysis met holding time criteria.

2. Duplicate

Sample A078-02 was analyzed for duplicate. %RPD was within QC limit.

3. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

ML 9045 PH

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14131
Batch No. : 06A078

Matrix : SOIL
Instrument ID : 153

SAMPLE ID	EMAX	SAMPLE ID	RESULTS (pHUnit)	DLF MOIST(pHUnit)	RL	MDL	Analysis DATE TIME	Extraction DATE TIME	LFID	CAL REF	PREP BATCH	Collection DATE TIME	Received DATE TIME
0004-072		A078-01	8.11	1	NA	NA	01/17/06 16:35	01/17/06 16:00	PHA004S-02	NA	PHA004S	01/17/06	01/17/06



AMERISCI

AmeriSci Richmond

13635 GENITO ROAD
MIDLOTHIAN, VA 23112
TEL: (804) 763-1200 • FAX: (804) 763-1800

PLM Bulk Asbestos Report

EMAX Laboratories, Inc.
Attn: Richard Beauvil
1835 205th Street
Torrance, CA 90501

Date Received 01/16/06

Date Examined 01/17/06

RE SES - TECH

AmeriSci Job No. 106011328

P.O. # SES - TECH

Page 1 of 1

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
0004-070	106011328-01	No	NAD ¹ (by 1000 pt ct)
Location:			

Description: Tan, Heterogeneous, Non-Fibrous, Soil
Asbestos Types:
Other Material: Non-fibrous 100 %

0004-071	106011328-02	No	NAD ¹ (by 1000 pt ct)
Location:			

Description: Brown, Heterogeneous, Non-Fibrous, Soil
Asbestos Types:
Other Material: Non-fibrous 100 %

Comment: Presence of Gray and Tan Cement-like Materials in Sample, which contain No Asbestos.

Reporting Notes:

(1) Sample analyzed by California Air Resources Board - Method 445 with 1000 pt ct analysis

Analyzed by: Gordon T. Saleeby *Gordon T. Saleeby* Date *Jan 17, 2006*
*NAD = no asbestos detected, Detection Limit <1%, Reporting Limits: CVES = 1%, 400 Pt Ct = 0.25%, 1000 Pt Ct = 0.1%;
"Present" or NVA = "No Visible Asbestos" are observations made during a qualitative analysis; NA = not analyzed; NA/PS = not analyzed / positive stop; PLM Bulk Asbestos Analysis by EPA 600/M4-82-020 per 40 CFR 763 (NVLAP Lab #101904-0) and ELAP PLM Analysis Protocol 198.1 for New York friable samples (198.6 for NOB samples) (NYSDOH ELAP Lab # 10984); CA ELAP Lab # 2508; Note: PLM is not consistently reliable in detecting asbestos in floor coverings and similar NOB materials. TEM is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos-containing in New York State (also see EPA Advisory for floor tile, FR 59, 146, 38970, 8/1/94). NIST Accreditation requirements mandate that this report must not be reproduced except in full without the approval of the laboratory. This PLM report relates ONLY to the items tested.

Reviewed By: _____

106011328

By

APPENDIX D

EXCAVATION COMPACTION REPORT

March 1, 2006
Project No. 105796001

Mr. Mark Cutler
Sealaska Environmental Services, LLC
603 Seagaze Drive, #542
Oceanside, California 92054

Subject: Summary of Compaction Testing
Buildings 1441, 14131, and 14137
MCB Camp Pendleton
San Diego County, California
Contract N68711-04-D-1104: P.O. 058318

Dear Mr. Cutler:

In accordance with your request, Ninyo & Moore has provided geotechnical observation and testing services during the backfill operations near Buildings 1441, 14131, and 14137 on Marine Corps Base (MCB) Camp Pendleton, located in San Diego County, California. The project sites are located within Area 14 of MCB Camp Pendleton and are situated approximately 1 mile east of Vandegrift Boulevard between 15th Street and 19th Street. The purpose of our services was to observe, document, and test the materials used during the backfill operations that were conducted by the contractor. We have performed field and laboratory tests on representative soil samples to characterize the backfill soils and to evaluate the relative compaction. Our findings and conclusions are presented herein.

BACKFILL OPERATIONS

Backfill operations observed and tested by our firm were conducted between the dates of January 31, 2006 and February 7, 2006. Our field technicians provided compaction testing on an on-call basis during the placement of compacted backfill. During backfill operations, trench excavations ranged from approximately 12 feet to 16 feet in depth. Backfill of the excavations was conducted utilizing a front-end loader and a track-hoe with a sheeps-foot attachment. In general, the loader placed and processed the backfill soil and the track-hoe applied the compaction effort. In accordance with the

project documents, the means and methods utilized to place and compact the backfill soils at depths greater than 5 feet were visually observed by our technician but we did not perform field density tests. The project documents indicated specified relative compaction for the uppermost 5 feet was a range of 90 to 95 percent for each layer with an average of 95 percent relative compaction.

FIELD AND LABORATORY TESTING

At your request, our field technicians were on-site to perform in-place field density tests. The tests were performed in general accordance with American Society of Testing and Materials (ASTM) test method D 2922 and D 3017 (Nuclear Gauge Method) and D 1556 (Sand Cone Testing). The summary of the results of our field density tests, the approximate test depths, and the associated building locations are presented in Table 1.

Laboratory testing was performed on a representative sample of the soil used during the earthwork operations to evaluate the modified Proctor dry density/optimum moisture content and expansion index. Laboratory testing of the modified Proctor dry density and optimum moisture content was conducted in general accordance with ASTM D 1557, and the results are presented in Table 2, Modified Proctor Density Test Results. Laboratory testing of the expansion index was conducted in general accordance with UBC 18-2, and the results are presented in Table 3, Expansion Index Test Results.

SUMMARY


Our technicians were on-site to observe the backfill operations. The field density tests performed during these operations indicated the specified relative compaction. Based on our observations and the results of our field and laboratory tests, it is our opinion that the backfill operations were performed in general accordance with the current standard of practice and care, and the project scope of work.

LIMITATIONS


The geotechnical services outlined in this report have been conducted in accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in this area. No warranty, expressed or implied, is made regarding the observations and conclusions expressed in this report. The reported test results represent the relative compaction and moisture content at the locations tested. It is important to note that the precision of field density tests and the modified Proctor dry density tests is not exact and variations should be expected. The reported locations and depths of the density tests are estimated based on correlations with the site surroundings. Further accuracy is not implied.

We appreciate the opportunity to be of service on this project. Should you have any questions related to this report, please contact the undersigned.

Sincerely,
NINYO & MOORE


Jeffrey T. Kent, P.E.
Project Engineer




Mark Cuthbert, P.E.
Principal Engineer

DLP/JTK/MC/ag/gg

Distribution: (2) Addressee

Attachments: Table 1 – Summary of Field Density Tests
Table 2 – Modified Proctor Density Test Results
Table 3 – Expansion Index Test Results

TABLE 1

SUMMARY OF FIELD DENSITY TESTS

PROJECT NO. 105796001

TEST OF: COMPACTED FILL

Test No.	Test of	Date	Test Location	Depth (ft)	Soil Type No.	Wet Density (pcf)	Field Moisture (%)	Dry Density (pcf)	Proctor Density (pcf)	Optimum Moisture Content (%)	Relative Compaction (%)	Specified Relative Compaction (%)	Remarks
1#	CF	2/1/06	Building 1441	5.0	1	127.0	9.3	116.2	122.0	11.5	95	90 - 95	
2*	CF	2/1/06	Building 1441	5.0	1	124.6	8.5	114.8	122.0	11.5	94	90 - 95	
3#	CF	2/1/06	Building 1441	4.0	1	131.9	12.2	117.6	122.0	11.5	96	90 - 95	
4#	CF	2/1/06	Building 1441	3.0	1	133.1	10.2	120.8	122.0	11.5	99	90 - 95	
5#	CF	2/1/06	Building 1441	2.0	1	130.9	9.1	120.0	122.0	11.5	98	90 - 95	
6#	CF	2/1/06	Building 1441	1.0	1	124.2	9.6	113.3	122.0	11.5	93	90 - 95	
7#	CF	2/1/06	Building 1441	1.0	1	129.3	11.2	116.3	122.0	11.5	95	90 - 95	
8#	CF	2/1/06	Building 1441	0.0	1	125.8	9.9	114.5	122.0	11.5	94	90 - 95	
9#	CF	2/1/06	Building 1441	0.0	1	129.6	10.9	116.9	122.0	11.5	96	90 - 95	
10#	CF	2/3/06	Building 14137	5.0	1	124.0	9.9	112.8	122.0	11.5	92	90 - 95	
11#	CF	2/3/06	Building 14137	5.0	1	129.8	11.8	116.1	122.0	11.5	95	90 - 95	
12#	CF	2/3/06	Building 14137	4.0	1	126.8	12.1	113.1	122.0	11.5	93	90 - 95	
13#	CF	2/3/06	Building 14137	4.0	1	130.7	12.0	116.7	122.0	11.5	96	90 - 95	
14#	CF	2/3/06	Building 14137	3.0	1	130.0	10.9	117.3	122.0	11.5	96	90 - 95	
15#	CF	2/3/06	Building 14137	2.0	1	130.1	10.1	118.2	122.0	11.5	97	90 - 95	
16#	CF	2/3/06	Building 14137	1.0	1	130.4	10.6	117.9	122.0	11.5	97	90 - 95	
17*	CF	2/3/06	Building 14137	3.0	1	123.9	9.1	113.6	122.0	11.5	93	90 - 95	
18*	CF	2/7/06	Building 14131	5.0	1	132.4	10.6	119.7	122.0	11.5	98	90 - 95	
19*	CF	2/7/06	Building 14131	4.0	1	129.8	10.4	117.6	122.0	11.5	96	90 - 95	
20#	CF	2/7/06	Building 14131	3.0	1	131.8	10.5	119.3	122.0	11.5	98	90 - 95	
21#	CF	2/7/06	Building 14131	2.0	1	131.1	14.8	114.2	122.0	11.5	94	90 - 95	
22#	CF	2/7/06	Building 14131	2.0	1	133.8	12.1	119.4	122.0	11.5	98	90 - 95	
23#	CF	2/7/06	Building 14131	1.0	1	132.8	9.7	121.1	122.0	11.5	99	90 - 95	
24#	CF	2/7/06	Building 14131	0.0	1	133.5	10.1	121.3	122.0	11.5	99	90 - 95	
Average Relative Compaction =											96	95	

* Test performed by Nuclear Gauge method (ASTM D2922 and D3017)

* Test performed by Sand Cone method (ASTM D 1556)

Table 2 – Modified Proctor Density Test Results

Soil Type No.	Description	Dry Density (pcf)	Optimum Moisture Content (%)
1	Grayish Brown Clayey SAND	122.0	11.5

Table 3 – Expansion Index Test Results

Soil Type No.	Expansion Index	Expansion Index	Specification
1	Very Low	16	<20

APPENDIX E

**LABORATORY ANALYTICAL REPORTS, FIELD SAMPLING LOGS,
AND NON-HAZARDOUS MATERIAL HAULING MANIFESTS FOR
WELL INSTALLATION AND MARCH 2006 GROUNDWATER
SAMPLING EVENT**

Date: 3/16/06 Project Name: UST Site 14131
 Personnel: WB, JS Project OFS: 2973.0040
 Weather: Sunny Measurement Device: Solinst
 Comments: _____

[illegible]

SES-TECH

Page 1 of 1

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: UST Site 14131
Project Number: 2973.0040
Date: 3/16/06
Site Engineer(s): WB, JS

Well Number: MW-5
Equipment: Honiba U-20
Sample ID: 0004-135 Time: 0925
Contractor: Nemo

Reference: Top of Casing

Before	After
<p>1. 1.00</p> <p>2. 1.00</p> <p>3. 1.00</p> <p>4. 1.00</p> <p>5. 1.00</p> <p>6. 1.00</p> <p>7. 1.00</p> <p>8. 1.00</p> <p>9. 1.00</p> <p>10. 1.00</p> <p>11. 1.00</p> <p>12. 1.00</p> <p>13. 1.00</p> <p>14. 1.00</p> <p>15. 1.00</p> <p>16. 1.00</p> <p>17. 1.00</p> <p>18. 1.00</p> <p>19. 1.00</p> <p>20. 1.00</p> <p>21. 1.00</p> <p>22. 1.00</p> <p>23. 1.00</p> <p>24. 1.00</p> <p>25. 1.00</p> <p>26. 1.00</p> <p>27. 1.00</p> <p>28. 1.00</p> <p>29. 1.00</p> <p>30. 1.00</p> <p>31. 1.00</p> <p>32. 1.00</p> <p>33. 1.00</p> <p>34. 1.00</p> <p>35. 1.00</p> <p>36. 1.00</p> <p>37. 1.00</p> <p>38. 1.00</p> <p>39. 1.00</p> <p>40. 1.00</p> <p>41. 1.00</p> <p>42. 1.00</p> <p>43. 1.00</p> <p>44. 1.00</p> <p>45. 1.00</p> <p>46. 1.00</p> <p>47. 1.00</p> <p>48. 1.00</p> <p>49. 1.00</p> <p>50. 1.00</p> <p>51. 1.00</p> <p>52. 1.00</p> <p>53. 1.00</p> <p>54. 1.00</p> <p>55. 1.00</p> <p>56. 1.00</p> <p>57. 1.00</p> <p>58. 1.00</p> <p>59. 1.00</p> <p>60. 1.00</p> <p>61. 1.00</p> <p>62. 1.00</p> <p>63. 1.00</p> <p>64. 1.00</p> <p>65. 1.00</p> <p>66. 1.00</p> <p>67. 1.00</p> <p>68. 1.00</p> <p>69. 1.00</p> <p>70. 1.00</p> <p>71. 1.00</p> <p>72. 1.00</p> <p>73. 1.00</p> <p>74. 1.00</p> <p>75. 1.00</p> <p>76. 1.00</p> <p>77. 1.00</p> <p>78. 1.00</p> <p>79. 1.00</p> <p>80. 1.00</p> <p>81. 1.00</p> <p>82. 1.00</p> <p>83. 1.00</p> <p>84. 1.00</p> <p>85. 1.00</p> <p>86. 1.00</p> <p>87. 1.00</p> <p>88. 1.00</p> <p>89. 1.00</p> <p>90. 1.00</p> <p>91. 1.00</p> <p>92. 1.00</p> <p>93. 1.00</p> <p>94. 1.00</p> <p>95. 1.00</p> <p>96. 1.00</p> <p>97. 1.00</p> <p>98. 1.00</p> <p>99. 1.00</p> <p>100. 1.00</p>	<p>1. 1.00</p> <p>2. 1.00</p> <p>3. 1.00</p> <p>4. 1.00</p> <p>5. 1.00</p> <p>6. 1.00</p> <p>7. 1.00</p> <p>8. 1.00</p> <p>9. 1.00</p> <p>10. 1.00</p> <p>11. 1.00</p> <p>12. 1.00</p> <p>13. 1.00</p> <p>14. 1.00</p> <p>15. 1.00</p> <p>16. 1.00</p> <p>17. 1.00</p> <p>18. 1.00</p> <p>19. 1.00</p> <p>20. 1.00</p> <p>21. 1.00</p> <p>22. 1.00</p> <p>23. 1.00</p> <p>24. 1.00</p> <p>25. 1.00</p> <p>26. 1.00</p> <p>27. 1.00</p> <p>28. 1.00</p> <p>29. 1.00</p> <p>30. 1.00</p> <p>31. 1.00</p> <p>32. 1.00</p> <p>33. 1.00</p> <p>34. 1.00</p> <p>35. 1.00</p> <p>36. 1.00</p> <p>37. 1.00</p> <p>38. 1.00</p> <p>39. 1.00</p> <p>40. 1.00</p> <p>41. 1.00</p> <p>42. 1.00</p> <p>43. 1.00</p> <p>44. 1.00</p> <p>45. 1.00</p> <p>46. 1.00</p> <p>47. 1.00</p> <p>48. 1.00</p> <p>49. 1.00</p> <p>50. 1.00</p> <p>51. 1.00</p> <p>52. 1.00</p> <p>53. 1.00</p> <p>54. 1.00</p> <p>55. 1.00</p> <p>56. 1.00</p> <p>57. 1.00</p> <p>58. 1.00</p> <p>59. 1.00</p> <p>60. 1.00</p> <p>61. 1.00</p> <p>62. 1.00</p> <p>63. 1.00</p> <p>64. 1.00</p> <p>65. 1.00</p> <p>66. 1.00</p> <p>67. 1.00</p> <p>68. 1.00</p> <p>69. 1.00</p> <p>70. 1.00</p> <p>71. 1.00</p> <p>72. 1.00</p> <p>73. 1.00</p> <p>74. 1.00</p> <p>75. 1.00</p> <p>76. 1.00</p> <p>77. 1.00</p> <p>78. 1.00</p> <p>79. 1.00</p> <p>80. 1.00</p> <p>81. 1.00</p> <p>82. 1.00</p> <p>83. 1.00</p> <p>84. 1.00</p> <p>85. 1.00</p> <p>86. 1.00</p> <p>87. 1.00</p> <p>88. 1.00</p> <p>89. 1.00</p> <p>90. 1.00</p> <p>91. 1.00</p> <p>92. 1.00</p> <p>93. 1.00</p> <p>94. 1.00</p> <p>95. 1.00</p> <p>96. 1.00</p> <p>97. 1.00</p> <p>98. 1.00</p> <p>99. 1.00</p> <p>100. 1.00</p>

Total Volume Purged (mL): 1800

Depth to Water (ft)

6.78	7.13
------	------

Depth of Well (ft)

14.29

Depth to Top of Screen (ft)

5

Screen Length (ft)

10

Pump Depth (ft)

Pump Rate

$$\frac{100 \text{ mg}}{\text{min}}$$

Sample Pump Rate

$$\frac{160 \text{ min}}{100}$$

System Volume (mL)

446

$$(2.4 \times 11) + 470 =$$
$$\text{System Volume (mL)} = (2.4 \cdot H) + 470$$

where

2.4mL/ft = tubing volume per foot (1/8" I.D.)

H = length of tubing in feet

$$470 \text{ mL} = \text{Bladder volume} + \text{Flowthru cell volume}$$
[illegible]

Hach Fe²⁺ W/A

Samples were collected directly from pump unless otherwise noted.

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: UST Site 14131
 Project Number: 2973.0040
 Date: 3/16/06
 Site Engineer(s): W.B. JS

Well Number: MW-3
 Equipment: Heriba U-22
 Sample ID: 0004-136 Time: 1038
 Contractor: None

Reference: Top of Casing Before After

Total Volume Purged (mL): 1800

Depth to Water (ft) 9.33
 Depth of Well (ft) 22.69
 Depth to Top of Screen (ft) 5.7
 Screen Length (ft) 15
 Pump Depth (ft) 17
 Pump Rate 100 mL/min
 Sample Pump Rate 100 mL/min
 System Volume (mL) 510

$$= (2.4)(17) + 470 = 510$$

System Volume (mL) = (2.4*H)+470
 where

2.4mL/ft = tubing volume per foot (1/8" I.D.)

H = length of tubing in feet

470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1014									
1017	7.12	5976	2.40	21.10	122	0.0	9.37	300	Pump on
1020	7.08	6000	1.35	21.33	116	0.0	9.43	600	Clear, no color
1023	7.06	6050	1.16	21.35	111	0.0	9.48	900	
1026	7.07	6050	0.94	21.54	107	0.0	9.52	1200	
1029	7.07	6060	0.92	21.78	105	0.0	9.60	1500	
1032	7.07	6060	0.82	21.79	103	0.0	9.63	1800	
1035									Stable
1038									Outlets sample
<i>[Signature]</i>									
Stability:	± 0.2 units	± 5 %	± 0.2 mg/L	± 3 %	± 20 mV	± 10 %			

Each Fe²⁺ n/A

Samples were collected directly from pump unless otherwise noted.

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: UST Site 14131
 Project Number: 2973.0040
 Date: 3/16/06
 Site Engineer(s): W.B., JS

Well Number: MW-6
 Equipment: Horiba U-22
 Sample ID: 1004-137 Time: 11:49
 Contractor: Nme

Reference: Top of Casing Before After

Total Volume Purged (mL): 1800

Depth to Water (ft) 5.99
 Depth of Well (ft) 14.67
 Depth to Top of Screen (ft) 5
 Screen Length (ft) 10
 Pump Depth (ft) 11
 Pump Rate 100 mL/min
 Sample Pump Rate 100 mL/min
 System Volume (mL) 496

$$(2.4 \times 11) + 470 = 496$$

$$\text{System Volume (mL)} = (2.4 \times H) + 470$$

where

2.4 mL/ft = tubing volume per foot (1/8" I.D.)

H = length of tubing in feet

470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1125									
1128	7.29	886	3.40	20.54	104	38.4	6.11	300	pump on
1131	7.24	840	3.11	20.28	104	26.3	6.19	600	clear, no odor
1134	7.26	827	2.95	20.05	101	16.0	6.23	900	
1137	7.29	814	2.93	20.10	99	15.4	6.29	1200	
1140	7.32	811	2.90	20.06	94	13.1	6.35	1500	
1143	7.33	809	2.86	20.09	89	15.8	6.41	1800	
1146									stable
1149									collected sample
1154									collected dup
<i>Clear</i>									
<i>[Signature]</i>									
Stability:	± 0.2 units	± 5 %	± 0.2 mg/L	± 3 %	± 20 mV	± 10 %			

Hach Fe²⁺ N/A

Samples were collected directly from pump unless otherwise noted.

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

CA 2170023533

Manifest Document No.

60190

2. Page 1 of

3. Generator's Name and Mailing Address

Poster Wheeler MCB Camp Pendleton
Tetra Tech Inc. 1230 Columbia Street Suite 500
San Diego, CA 92101 PO Box 555008, Camp Pendleton, CA 92055

4. Generator's Phone (760-725-0000)

Attn: Nate Robinson

92055

5. Transporter 1 Company Name

General Environmental Mgmt Inc.

US EPA ID Number

CAD983649880

A. State Transporter's ID

B. Transporter 1 Phone 800-326-1011

7. Transporter 2 Company Name

8.

US EPA ID Number

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address

Candelaria Environmental
4001 Candelaria Lane
Anza, CA 92539

10.

US EPA ID Number

US ECOLOGY NVT330010000
HWY 95, 11 MILES S. OF BEATTY
BEATTY, NV 89003

E. State Facility's ID

F. Facility's Phone

619-696-6207

11. WASTE DESCRIPTION

a. Non hazardous solid (Soil)

12. Containers

No.

Type

13. Total Quantity

14. Unit Wt/Vol.

23

DM

13.800
12.800
Est - 800

G.V.

G. Additional Descriptions for Materials Listed Above

11a) x55g-Approval#

H. Handling Codes for Wastes Listed Above

WO# 162734

15. Special Handling Instructions and Additional Information

Emergency Phone: (800) 326-1011 (G.E.M.)

Site: Assistant Chief of Staff-Bldg#22165 Assistant Chief, Camp Pendleton, CA 92055

UST sites 52710, 2389, (14131), 14137

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name

Margo Williams

Signature

Margo Williams

Date

Month Day Year

4/20/06

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

JOSE T VASQUEZ

Signature

Jose T Vasquez

Month Day Year

04/20/06

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name

Signature

Date

Month Day Year



NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

CA 2170023533

Manifest Document No.

60189

2. Page 1 of

3. Generator's Name and Mailing Address

~~Coastal Wheeler~~ MCB Camp Pendleton
~~Tetra Tech FW, Inc. 1236 Columbia Street Suite 500~~
~~San Diego, CA 92101~~ PO Box 555008, Camp Pendleton, CA 92055

4. Generator's Phone

(760) 725-0189

Attn: ~~Not a Detention~~ Chief of Staff

92055

5. Transporter 1 Company Name

General Environmental Mgmt Inc.

CA D 983649880

A. State Transporter's ID

B. Transporter 1 Phone 800-326-1011

C. State Transporter's ID

D. Transporter 2 Phone

E. State Facility's ID

F. Facility's Phone

909-476-2308

7. Transporter 2 Company Name

8.

US EPA ID Number

9. Designated Facility Name and Site Address

K-Pure

8910 Rochester Avenue

Rancho Cucamonga, CA 91730

10.

US EPA ID Number

11. WASTE DESCRIPTION

a.

Non hazardous liquid (Well Water)

12. Containers
No. Type

5

D M

13. Total Quantity

EST.
250

14. Unit
WL/Vol.

b.

c.

d.

G. Additional Descriptions to: Materials Listed Above

11a) 5 x55g-Approval#

WO# 162734

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

Emergency Phone: (800) 326-1011 (G.E.M.)

Site: Assistant Chief of Staff-Bldg #22165-Assistant Chief, Camp Pendleton, CA 92055

UST Site 52710, 2389, (14131), 14137, 1133, 21454/533, 1791

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name

Margo Williams

Signature

Margo Williams

Date

Month Day Year
4/20/06

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

JOSE T VASQUEZ

Signature

Jose T Vasquez

Date

Month Day Year
09/20/06

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name

Signature

Date

Month Day Year





TETRA TECH
1130 Columbia Street, Suite 400
San Diego, CA 92101 (619) 334-9494

CHAIN-OF-CUSTODY RECORD

NUMBER 20347

PAGE.04

7605777537

MAR 26 2006 10:31

PROJECT NAME Imo Pendleton		PURCHASE ORDER NO. 0510080		ANALYSES REQUIRED WAB 3/16/06		LABORATORY NAME EMAX		Project Information Section Do not submit to Laboratory	
PROJECT LOCATION DST site 14131		PROJECT NO. 2973.6040		LABORATORY ID (FOR LABORATORY) 066154		COMMENTS		LOCATION	
SAMPLER NAME Wardw Bryant		AMBUL NUMBER Courier		PROJECT CONTACT PHONE NUMBER 949-756-7588		COMMENTS		DEPTH	
PROJECT CONTACT Vick Weinberger		DATE COLLECTED		TIME COLLECTED		NO. OF CONTAINERS		START	
SAMPLE ID		DATE COLLECTED		TIME COLLECTED		NO. OF CONTAINERS		END	
LEVEL		T		A		T		QC	
3		4		5		6		7	
1004-134		3/16/06		0809		3		Trip Blank	
0004-135		3/16/06		0925		5		MW5	
0004-136		3/16/06		1030		15		MW3	
0004-137		3/16/06		1149		5		MW6	
0004-138		3/16/06		1154		5		MW6	
0004-139		3/16/06		1215		5		Equip Ring	
RELINQUISHED BY (Signature) HEDD		DATE 3/16/06		TIME 1420		NO. OF CONTAINERS 5		LABORATORY INSTRUCTIONS/COMMENTS	
RECEIVED BY (Signature) EMAX		DATE 3/16/06		TIME 1420		NO. OF CONTAINERS 5		COMPOSITE DESCRIPTION	
COMPANY HEDD		DATE 3/16/06		TIME 1420		NO. OF CONTAINERS 5		SAMPLING COMMENT:	
RELINQUISHED BY (Signature)		DATE		TIME		NO. OF CONTAINERS		LABORATORY INSTRUCTIONS/COMMENTS	
COMPANY		DATE		TIME		NO. OF CONTAINERS		COMPOSITE DESCRIPTION	
RELINQUISHED BY (Signature)		DATE		TIME		NO. OF CONTAINERS		LABORATORY INSTRUCTIONS/COMMENTS	
COMPANY		DATE		TIME		NO. OF CONTAINERS		COMPOSITE DESCRIPTION	

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14131

METHOD 5030B/8260B
VOLATILE ORGANICS BY GC/MS

SDG#: 06C154

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG: 06C154

METHOD 5030B/8260B VOLATILE ORGANICS BY GC/MS

Six (6) water samples were received on 03/16/06 for Volatile Organic analysis by Method 5030B/8260B in accordance with USEPA SW846, 3rd ed.

1. Holding Time

Analytical holding time was met.

2. Tuning and Calibration

Tuning and calibration were carried out at 12-hour interval. All QC requirements were met except:

Date	QC	Compound	Outlier	QC Limit
03/17/06	DCC	Trans-1,3-Dichloropropene	26%	<25%

3. Method Blank

Method blanks were free of contamination at half of the reporting limit.

4. Surrogate Recovery

Recoveries were within QC limit.

5. Lab Control Sample/Lab Control Sample Duplicate

Recoveries were within QC limit.

6. Matrix Spike/Matrix Spike Duplicate

Sample C154-03 was spiked. All recoveries were within QC limit.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception.

LAB CHRONICLE
VOLATILE ORGANICS BY GC/MS



Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14131
SDG NO. : 06C154
Instrument ID : I-067

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	WATER					Notes
				Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Prep.		
							Data FN	Batch	
MBLK1W	V067C23Q	1	NA	03/17/0616:45	03/17/0616:45	RCC367	RCC192	V067C23	Method Blank
LCST1W	V067C23L	1	NA	03/17/0614:58	03/17/0614:58	RCC364	RCC192	V067C23	Lab Control Sample (LCS)
LCST1W	V067C23C	1	NA	03/17/0615:34	03/17/0615:34	RCC365	RCC192	V067C23	LCS Duplicate
0004-134	C154-01	1	NA	03/17/0617:56	03/17/0617:56	RCC369	RCC192	V067C23	Field Sample
0004-135	C154-02	1	NA	03/17/0622:05	03/17/0622:05	RCC376	RCC192	V067C23	Field Sample
0004-137	C154-04	1	NA	03/17/0622:41	03/17/0622:41	RCC377	RCC192	V067C23	Field Sample
0004-138	C154-05	1	NA	03/17/0623:16	03/17/0623:16	RCC378	RCC192	V067C23	Field Sample
MBLK2W	V067C27Q	1	NA	03/21/0602:06	03/21/0602:06	RCC409	RCC192	V067C27	Method Blank
LCST2W	V067C27L	1	NA	03/21/0600:20	03/21/0600:20	RCC406	RCC192	V067C27	Lab Control Sample (LCS)
LCST2W	V067C27C	1	NA	03/21/0600:56	03/21/0600:56	RCC407	RCC192	V067C27	LCS Duplicate
0004-136	C154-03	1	NA	03/21/0602:42	03/21/0602:42	RCC410	RCC192	V067C27	Field Sample
0004-139	C154-06	1	NA	03/21/0603:17	03/21/0603:17	RCC411	RCC192	V067C27	Field Sample
0004-136MS	C154-03M	1	NA	03/21/0608:01	03/21/0608:01	RCC419	RCC192	V067C27	Matrix Spike Sample (MS)
0004-136MSD	C154-03S	1	NA	03/21/0608:37	03/21/0608:37	RCC420	RCC192	V067C27	MS Duplicate (MSD)

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

SW 50308/82608
VOLATILE ORGANICS BY GC/MS



```

=====
Client      : SES-TECH                      Date Collected: 03/16/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Batch No.   : 06C154                      Date Extracted: 03/17/06 17:56
Sample ID   : 0004-134                    Date Analyzed: 03/17/06 17:56
Lab Samp ID : C154-01                     Dilution Factor: 1
Lab File ID : RCC369                      Matrix          : WATER
Ext Btch ID : V067C23                     % Moisture      : NA
Calib. Ref. : RCC192                      Instrument ID   : T-067
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
BROMOCHLOROMETHANE	ND	5	.2
TOLUENE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	90	65-135
TOLUENE-D8	98	75-125
BROMOFLUOROBENZENE	106	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

EMAX
LABORATORY, INC.

=====

Client : SES-TECH	Date Collected: 03/16/06
Project : CAMP PENDLETON, UST SITE 14131	Date Received: 03/16/06
Batch No. : 06C154	Date Extracted: 03/17/06 22:05
Sample ID: 0004-135	Date Analyzed: 03/17/06 22:05
Lab Samp ID: C154-02	Dilution Factor: 1
Lab File ID: RCC376	Matrix : WATER
Ext Btch ID: VO67C23	% Moisture : NA
Calib. Ref.: RCC192	Instrument ID : T-067

=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
BROMOCHLOROMETHANE	ND	5	.2
1,4-DIBENZENE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	93	65-135
TOLUENE-D8	97	75-125
BROMOFLUOROBENZENE	102	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```
=====
Client      : SES-TECH                      Date Collected: 03/16/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Vial No.    : 06C154                      Date Extracted: 03/21/06 02:42
Sample ID   : 0004-136                    Date Analyzed: 03/21/06 02:42
Lab Samp ID : C154-03                     Dilution Factor: 1
Lab File ID : RCC410                      Matrix          : WATER
Ext Btch ID : V067C27                    % Moisture      : NA
Calib. Ref. : RCC192                     Instrument ID   : T-067
=====
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
CHLOROMETHANE	ND	5	.2
CHLOROBENZENE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	99	65-135
TOLUENE-D8	100	75-125
BROMOFLUOROBENZENE	106	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

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=====
Client      : SES-TECH                      Date Collected: 03/16/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Lab No.     : 06C154                      Date Extracted: 03/17/06 22:41
Sample ID   : 0004-137                    Date Analyzed: 03/17/06 22:41
Lab Samp ID : C154-04                     Dilution Factor: 1
Lab File ID : RCC377                      Matrix          : WATER
Ext Btch ID : VO67C23                    % Moisture      : NA
Calib. Ref. : RCC192                     Instrument ID   : T-067
=====

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PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
BROMOCHLOROMETHANE	ND	5	.2
1,2-DIBROMOETHANE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	97	65-135
TOLUENE-D8	101	75-125
BROMOFLUOROBENZENE	107	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

Data File : D:\HPCHEM\1\DATA\06C17\RCC377.D

Acq On : 17 Mar 2006 10:41 pm

Sample : 06C154-04 25ml

Misc : DF=1.0

Vial: 17

Operator: DN

Inst : TO67

Multiplr: 1.00

MS Integration Params: LSCINT.P

Quant Time: Mar 20 10:40 2006

Quant Results File: VO67C09.RES

Quant Method : D:\HPCHEM\1\METHODS\VO67C09.M (RTE Integrator)

Title : METHOD 8260 25ml

Last Update : Fri Mar 10 12:03:16 2006

Response via : Initial Calibration

DataAcq Meth : VO67C09

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-DIFLUOROBENZENE	10.17	114	2174863	10.00	ug/l	0.00
36) CHLOROBENZENE-D5	15.74	117	1932508	10.00	ug/l	0.00
66) 1,2-DICHLOROBENZENE-D4	22.53	152	574823	10.00	ug/l	0.00
System Monitoring Compounds						
35) 1,2-Dichloroethane-d4	9.70	65	350675	9.67	ug/l	0.00
Spiked Amount 10.000			Recovery	=	96.70%	
49) Toluene-d8	12.70	98	1932264	10.11	ug/l	-0.02
Spiked Amount 10.000			Recovery	=	101.10%	
70) 4-Bromofluorobenzene	18.49	95	760394	10.68	ug/l	0.00
Spiked Amount 10.000			Recovery	=	106.80%	
Target Compounds						
18) Carbon disulfide	7.01	76	100971	0.29	ug/l	Qvalue 100

(#) = qualifier out of range (m) = manual integration

RCC377.D VO67C09.M Mon Mar 20 10:40:15 2006

Page 1

2006

Quantitation Report

EMAX
LABORATORY, INC.

Data File : D:\HPCHEM\1\DATA\06C17\RCC377.D

Vial: 17

Acq On : 17 Mar 2006 10:41 pm

Operator: DN

Sample : 06C154-04 25ml

Inst : TO67

Misc : DF=1.0

Multiplr: 1.00

MS Integration Params: LSCINT.P

Quant Time: Mar 20 10:40 2006

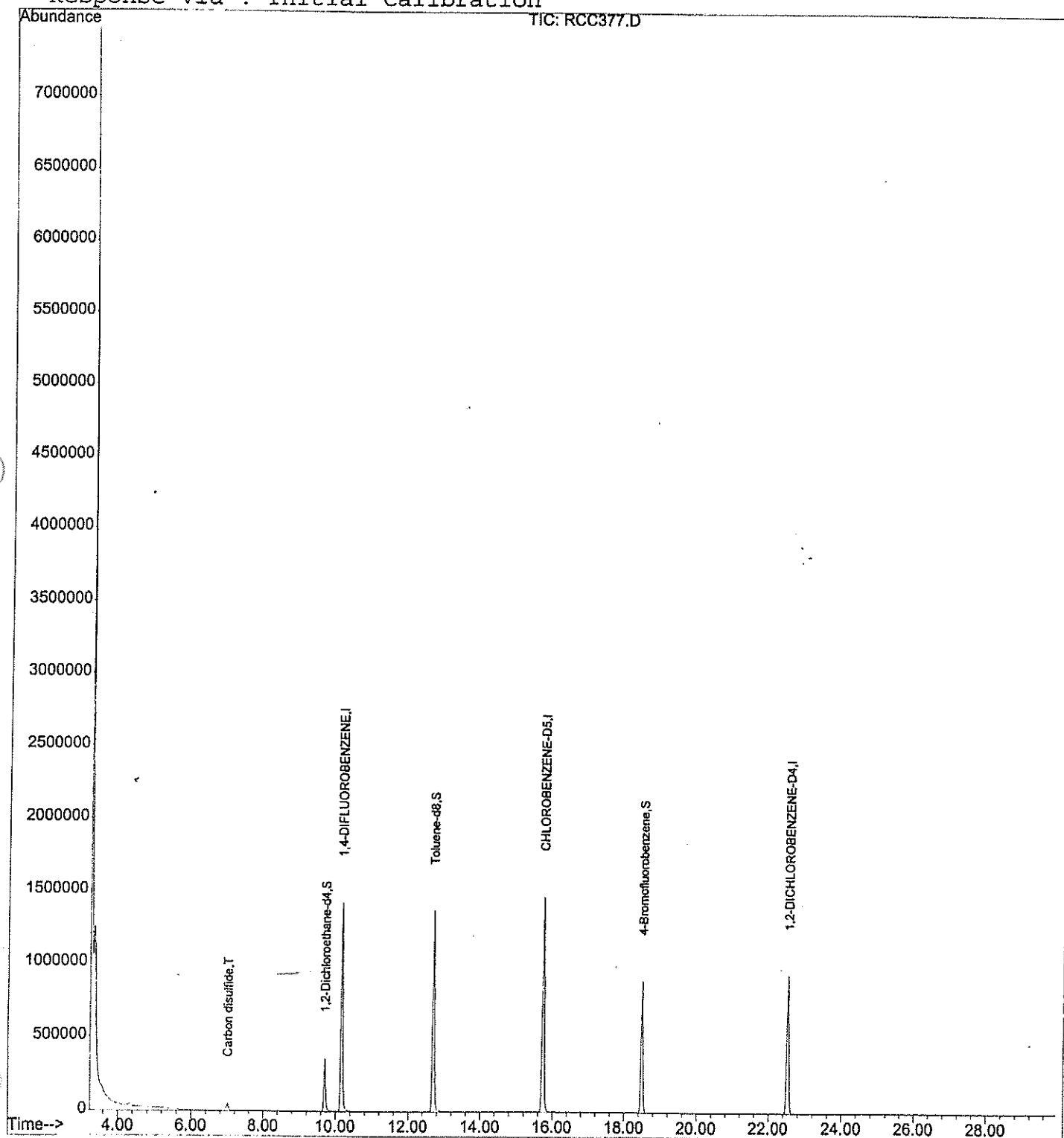
Quant Results File: VO67C09.RES

Method : D:\HPCHEM\1\METHODS\VO67C09.M (RTE Integrator)

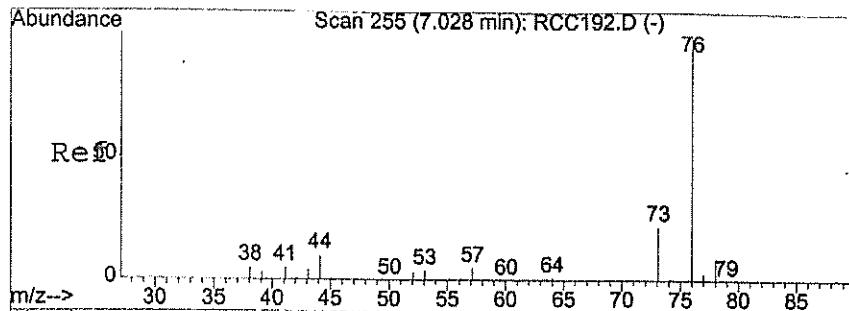
Title : METHOD 8260 25ml

Last Update : Fri Mar 10 12:03:16 2006

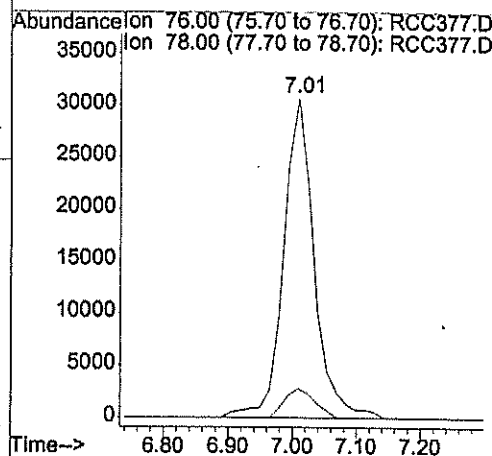
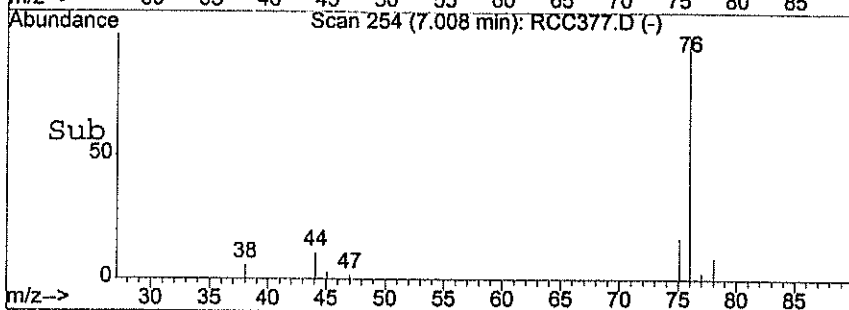
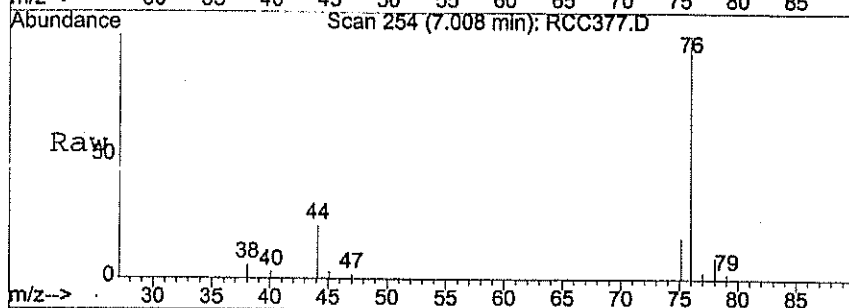
Response via : Initial Calibration



#18
Carbon disulfide
Concen: 0.29 ug/l
RT: 7.01 min Scan# 254
Delta R.T. -0.02 min
Lab File: RCC377.D
Acq: 17 Mar 2006 10:41 pm



Tgt Ion: 76 Resp: 100971
Ion Ratio Lower Upper
76 100
78 8.9 0.0 38.9



SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

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=====
Client      : SES-TECH                      Date Collected: 03/16/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Batch No.   : 06C154                      Date Extracted: 03/17/06 23:16
Sample ID   : 0004-138                    Date Analyzed: 03/17/06 23:16
Lab Samp ID : C154-05                     Dilution Factor: 1
Lab File ID : RCC378                      Matrix          : WATER
Ext Btch ID : V067C23                    % Moisture      : NA
Calib. Ref. : RCC192                     Instrument ID   : T-067
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
CHLOROMETHANE	ND	5	.2
CHLOROBENZENE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	94	65-135
TOLUENE-D8	96	75-125
BROMOFLUOROBENZENE	101	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

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=====
Client       : SES-TECH                      Date Collected: 03/16/06
Project      : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Sh No.       : 06C154                       Date Extracted: 03/21/06 03:17
Sample ID    : 0004-139                     Date Analyzed: 03/21/06 03:17
Lab Samp ID  : C154-06                     Dilution Factor: 1
Lab File ID  : RCC411                      Matrix       : WATER
Ext Btch ID  : V067C27                    % Moisture   : NA
Calib. Ref.  : RCC192                     Instrument ID : T-067
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	9.2J	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	.28J	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
BROMOCHLOROMETHANE	ND	5	.2
1,2-DIBROMOETHANE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	98	65-135
TOLUENE-D8	102	75-125
BROMOFLUOROBENZENE	107	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

QC SUMMARIES

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```
=====
Client      : SES-TECH                      Date Collected: NA
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/17/06
In No.      : 06C154                       Date Extracted: 03/17/06 16:45
Sample ID   : MBLK1W                       Date Analyzed: 03/17/06 16:45
Lab Samp ID : V067C23Q                     Dilution Factor: 1
Lab File ID : RCC367                       Matrix          : WATER
Ext Btch ID : V067C23                     % Moisture      : NA
Calib. Ref. : RCC192                       Instrument ID    : T-067
=====
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
BROMOCHLOROMETHANE	ND	5	.2
FLUOROBENZENE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	107	65-135
TOLUENE-D8	106	75-125
BROMOFLUOROBENZENE	111	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
BATCH NO.: 06C154
MOD: SW 50308/8260B

MATRIX: WATER
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: VO67C23Q VO67C23L VO67C23C
LAB FILE ID: RCC367 RCC364 RCC365
DATE EXTRACTED: 03/17/0616:45 03/17/0614:58 03/17/0615:34
DATE ANALYZED: 03/17/0616:45 03/17/0614:58 03/17/0615:34
PREP. BATCH: VO67C23 VO67C23 VO67C23
CALIB. REF: RCC192 RCC192 RCC192

% MOISTURE: NA

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
1,1-Dichloroethene	ND	10	10.3	103	10	10.5	105	2	75-125	20
Benzene	ND	10	11	110	10	11.2	112	1	75-125	20
Chlorobenzene	ND	10	11.2	112	10	11.4	114	2	75-125	20
Toluene	ND	10	11	110	10	11.4	114	3	75-125	20
Trichloroethene	ND	10	10.7	107	10	11	110	3	75-125	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	10	10.8	108	10	10.9	109	65-135
Toluene-d8	10	10.7	107	10	10.9	109	75-125
Bromofluorobenzene	10	10.3	103	10	10.3	103	75-125

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

EMAX
LABORATORY, INC.

```

=====
Client      : SES-TECH                      Date Collected: NA
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/21/06
In No.      : 06C154                       Date Extracted: 03/21/06 02:06
Sample ID   : MBLK2W                       Date Analyzed: 03/21/06 02:06
Lab Samp ID : VO67C27Q                     Dilution Factor: 1
Lab File ID : RCC409                       Matrix       : WATER
Ext Btch ID : VO67C27                     % Moisture   : NA
Calib. Ref. : RCC192                     Instrument ID : T-067
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
FLUOROBENZENE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	106	65-135
TOLUENE-D8	100	75-125
BROMOFLUOROBENZENE	108	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

20060321

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
PATCH NO.: 06C154
DD: SW 50308/8260B

MATRIX: WATER
DILUTION FACTOR: 1 1 % MOISTURE: NA
SAMPLE ID: MBLK2W
LAB SAMP ID: VO67C27Q VO67C27L VO67C27C
LAB FILE ID: RCC409 RCC406 RCC407
DATE EXTRACTED: 03/21/0602:06 03/21/0600:20 03/21/0600:56 DATE COLLECTED: NA
DATE ANALYZED: 03/21/0602:06 03/21/0600:20 03/21/0600:56 DATE RECEIVED: 03/21/06
PREP. BATCH: VO67C27 VO67C27 VO67C27
CALIB. REF: RCC192 RCC192 RCC192

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
1,1-Dichloroethene	ND	10	9.56	96	10	9.09	91	5	75-125	20
Benzene	ND	10	10	100	10	9.58	96	4	75-125	20
Chlorobenzene	ND	10	10.1	101	10	9.63	96	4	75-125	20
Toluene	ND	10	9.96	100	10	9.65	97	3	75-125	20
Trichloroethene	ND	10	9.58	96	10	9.2	92	4	75-125	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	10	9.59	96	10	9.63	96	65-135
Toluene-d8	10	9.45	95	10	9.12	91	75-125
Bromofluorobenzene	10	9.58	96	10	8.94	89	75-125

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
H NO.: 06C154
OD: SW 5030B/8260B

MATRIX: WATER
DILUTION FACTOR: 1 1 % MOISTURE: NA
SAMPLE ID: 0004-136
LAB SAMP ID: C154-03 C154-03M C154-03S
LAB FILE ID: RCC410 RCC419 RCC420
DATE EXTRACTED: 03/21/0602:42 03/21/0608:01 03/21/0608:37 DATE COLLECTED: 03/16/06
DATE ANALYZED: 03/21/0602:42 03/21/0608:01 03/21/0608:37 DATE RECEIVED: 03/16/06
PREP. BATCH: VO67C27 VO67C27 VO67C27
CALIB. REF: RCC192 RCC192 RCC192

ACCESSION:

PARAMETER	SMPL RSLT (ug/L)	SPIKE AMT (ug/L)	MS RSLT (ug/L)	MS % REC	SPIKE AMT (ug/L)	MSD RSLT (ug/L)	MSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
1,1-Dichloroethene	ND	10	8.68	87	10	8.58	86	1	75-125	20
Benzene	ND	10	9.08	91	10	9.27	93	2	75-125	20
Chlorobenzene	ND	10	9.54	95	10	9.6	96	1	75-125	20
Toluene	ND	10	9.28	93	10	9.52	95	3	75-125	20
Trichloroethene	ND	10	8.66	87	10	9.04	90	4	75-125	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	MS RSLT (ug/L)	MS % REC	SPIKE AMT (ug/L)	MSD RSLT (ug/L)	MSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	10	9.95	99	10	9.03	90	65-135
Toluene-d8	10	9.21	92	10	8.61	86	75-125
Bromofluorobenzene	10	8.97	90	10	8.28	83	75-125

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14131

METHOD 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

SDG#: 06C154

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG: 06C154

METHOD 3520C/8270C SIM SEMI VOLATILE ORGANICS BY GC/MS

Five (5) water samples were received on 03/16/06 for Semi Volatile Organic analysis by Method 3520C/8270C SIM in accordance with USEPA SW846, 3rd ed.

1. Holding Time

Analytical holding time was met.

2. Tuning and Calibration

Tuning and calibration were carried out at 12-hour interval. All QC requirements were met.

3. Method Blank

Method blank was free of contamination at half of the reporting limit.

4. Surrogate Recovery

Recoveries were within QC limit.

5. Lab Control Sample/Lab Control Sample Duplicate

Recoveries were within QC limit.

6. Matrix Spike/Matrix Spike Duplicate

Sample C154-03 was spiked. All recoveries were within QC limit except five analytes were out of QC limits in MS.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception.

LAB CHRONICLE
SEMI VOLATILE ORGANICS BY GC/MS



Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14131
SDG NO. : 06C154
Instrument ID : T-048

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	WATER		Extraction DateTime	Sample Data FN	Calibration Prep.		Notes
				Analysis DateTime				Data FN	Batch	
MBLK1W	SVC018WB	1	NA	03/20/0611:37		03/17/0617:00	RCZ256	RCZ053	SVC018W	Method Blank
LCS1W	SVC018WL	1	NA	03/20/0611:56		03/17/0617:00	RCZ257	RCZ053	SVC018W	Lab Control Sample (LCS)
LCD1W	SVC018WC	1	NA	03/20/0612:15		03/17/0617:00	RCZ258	RCZ053	SVC018W	LCS Duplicate
0004-135	C154-02	.97	NA	03/20/0618:48		03/17/0617:00	RCZ275	RCZ053	SVC018W	Field Sample
0004-136	C154-03	.94	NA	03/20/0619:07		03/17/0617:00	RCZ276	RCZ053	SVC018W	Field Sample
0004-137	C154-04	.95	NA	03/20/0620:05		03/17/0617:00	RCZ279	RCZ053	SVC018W	Field Sample
0004-138	C154-05	.94	NA	03/20/0620:24		03/17/0617:00	RCZ280	RCZ053	SVC018W	Field Sample
0004-139	C154-06	.94	NA	03/20/0620:43		03/17/0617:00	RCZ281	RCZ053	SVC018W	Field Sample
0004-136MS	C154-03M	.94	NA	03/20/0619:26		03/17/0617:00	RCZ277	RCZ053	SVC018W	Matrix Spike Sample (MS)
0004-136MSD	C154-03S	.94	NA	03/20/0619:46		03/17/0617:00	RCZ278	RCZ053	SVC018W	MS Duplicate (MSD)

FN - Filename
% Moist - Percent Moisture

00002

SAMPLE RESULTS

SW 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

```

=====
Client      : SES-TECH                      Date Collected: 03/16/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Batch No.   : 06C154                      Date Extracted: 03/17/06 17:00
Sample ID   : 0004-135                   Date Analyzed: 03/20/06 18:48
Lab Samp ID : C154-02                    Dilution Factor: .97
Lab File ID : RCZ275                     Matrix          : WATER
Ext Btch ID : SVC018W                   % Moisture      : NA
Calib. Ref. : RCZ053                    Instrument ID   : T-048
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.97	.19
ACENAPHTHYLENE	ND	.97	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.97	.19
BENZO(B)FLUORANTHENE	ND	.97	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.97	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.97	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.97	.19
NAPHTHALENE	ND	.97	.19
PHENANTHRENE	ND	.97	.19
PYRENE	ND	1.9	.19

PROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	71	50-130

RL: Reporting Limit

SW 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

```

=====
Client      : SES-TECH                      Date Collected: 03/16/06
Object     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Batch No.  : 06C154                        Date Extracted: 03/17/06 17:00
Sample ID  : 0004-136                      Date Analyzed: 03/20/06 19:07
Lab Samp ID: C154-03                      Dilution Factor: .94
Lab File ID: RC2276                       Matrix          : WATER
Ext Btch ID: SVC018W                     % Moisture      : NA
Calib. Ref.: RC2053                      Instrument ID   : T-048
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.94	.19
ACENAPHTHYLENE	ND	.94	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.94	.19
BENZO(B)FLUORANTHENE	ND	.94	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.94	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.94	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.94	.19
NAPHTHALENE	ND	.94	.19
PHENANTHRENE	ND	.94	.19
PYRENE	ND	1.9	.19

PROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	72	50-130

RL: Reporting Limit

SW 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

```

=====
Client      : SES-TECH                      Date Collected: 03/16/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Batch No.   : 06C154                      Date Extracted: 03/17/06 17:00
Sample ID   : 0004-137                    Date Analyzed: 03/20/06 20:05
Lab Samp ID : C154-04                     Dilution Factor: .95
Lab File ID : RC2279                      Matrix          : WATER
Ext Btch ID : SVC018W                     % Moisture      : NA
Calib. Ref. : RC2053                     Instrument ID   : T-048
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.95	.19
ACENAPHTHYLENE	ND	.95	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.95	.19
BENZO(B)FLUORANTHENE	ND	.95	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.95	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.95	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.95	.19
NAPHTHALENE	ND	.95	.19
PHENANTHRENE	ND	.95	.19
PYRENE	ND	1.9	.19

PROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	69	50-130

RL: Reporting Limit

Data File : D:\CHEMDATA\06C20\RCZ279.D

Vial: 27

Acq On : 20 MAR 2006 20:05

Operator: KV

Sample : 06C154-04

Inst : TO48

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: Mar 21 12:22 2006

Quant Results File: SV48C02.RES

Quant Method : C:\HPCHEM\1\METHODS\SV48C02.M (RTE Integrator)

Title : METHOD 8270C SIM GCMS-QP5000

Last Update : Mon Mar 06 10:16:41 2006

Response via : Initial Calibration

DataAcq Meth :

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	2.76	152	203338	10.00	ng	0.00
20) Phenanthrene-d10	6.74	188	335152	10.00	ng	0.00
28) Perylene-d12	10.47	264	180026	10.00	ng	0.00
System Monitoring Compounds						
3) Phenol-d5	2.48	99	11631	0.38	ng	0.00
27) Terphenyl-d14	8.28	244	120945	6.88	ng	0.00
Target Compounds						
31) bis(2-Ethylhexyl)phthalate	9.38	149	15645712	362.57	ng	Qvalue 95

(#) = qualifier out of range (m) = manual integration

RCZ279.D SV48C02.M

Tue Mar 21 12:23:02 2006

TO48

Page 1

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Quantitation Report

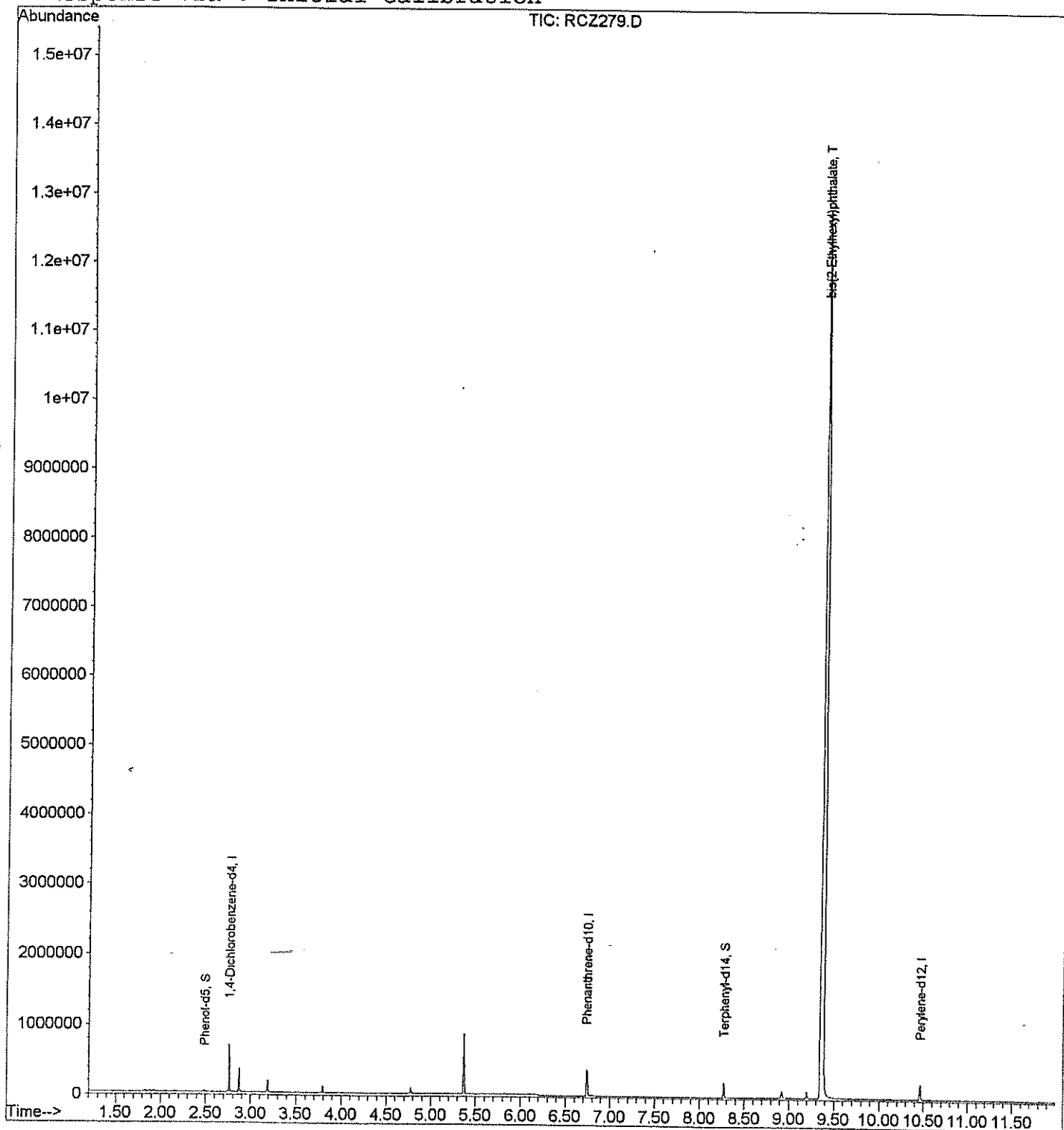
EMAX
LABORATORY, INC.

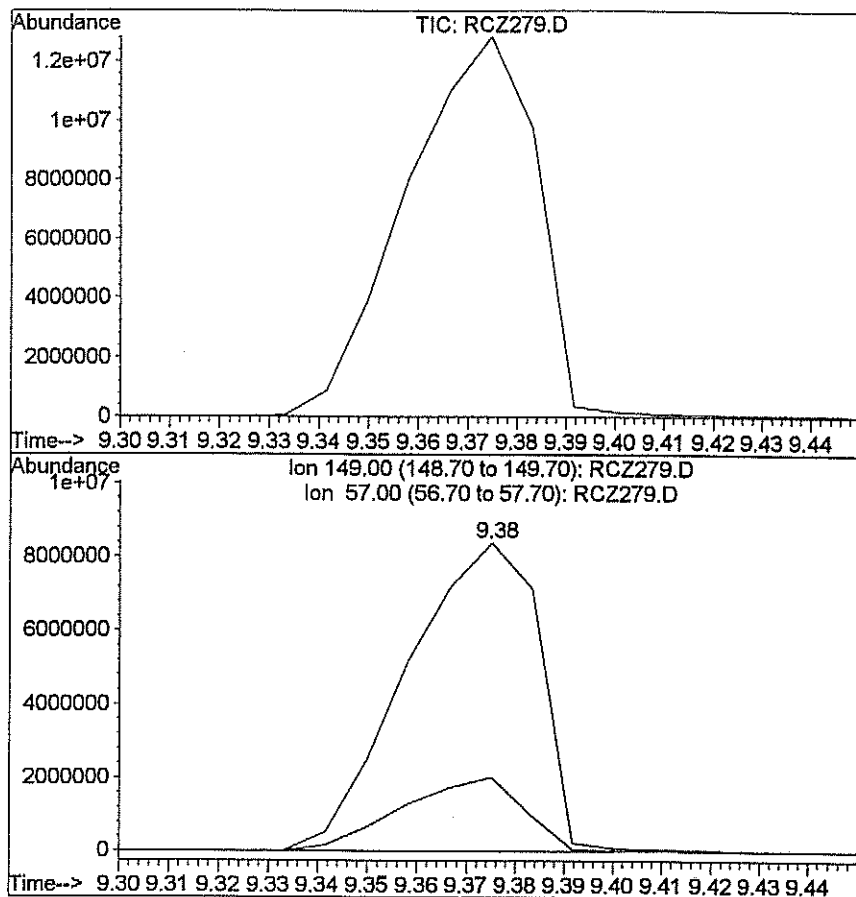
Data File : D:\CHEMDATA\06C20\RCZ279.D
Acq On : 20 MAR 2006 20:05
Sample : 06C154-04
Misc :
MS Integration Params: RTEINT.P
Quant Time: Mar 21 12:22 2006

Vial: 27
Operator: KV
Inst : T048
Multiplr: 1.00

Quant Results File: SV48C02.RES

Method : C:\HPCHEM\1\METHODS\SV48C02.M (RTE Integrator)
Title : METHOD 8270C SIM GCMS-QP5000
Last Update : Mon Mar 06 10:16:41 2006
Response via : Initial Calibration





#31

bis(2-Ethylhexyl)phthalate

Concen: 362.57 ng

RT: 9.38 min Scan# 980

Delta R.T. 0.03 min

Lab File: RCZ279.D

Acq: 20 MAR 2006 20:05

Tgt Ion:149 Resp:15645712

Ion Ratio Lower Upper

149 100

57 24.0 0.0 56.4

SW 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

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=====
Client       : SES-TECH                      Date Collected: 03/16/06
Project      : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Batch No.    : 06C154                      Date Extracted: 03/17/06 17:00
Sample ID    : 0004-138                    Date Analyzed: 03/20/06 20:24
Lab Samp ID  : C154-05                     Dilution Factor: .94
Lab File ID  : RCZ280                      Matrix       : WATER
Ext Btch ID  : SVC018W                    % Moisture   : NA
Calib. Ref.  : RCZ053                     Instrument ID : T-048
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.94	.19
ACENAPHTHYLENE	ND	.94	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.94	.19
BENZO(B)FLUORANTHENE	ND	.94	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.94	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.94	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.94	.19
NAPHTHALENE	ND	.94	.19
PHENANTHRENE	ND	.94	.19
PYRENE	ND	1.9	.19

PROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	71	50-130

RL: Reporting Limit

SW 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

=====
Client : SES-TECH Date Collected: 03/16/06
Project : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Batch No. : 06C154 Date Extracted: 03/17/06 17:00
Sample ID: 0004-139 Date Analyzed: 03/20/06 20:43
Lab Samp ID: C154-06 Dilution Factor: .94
Lab File ID: RCZ281 Matrix : WATER
Ext Btch ID: SVC018W % Moisture : NA
Calib. Ref.: RCZ053 Instrument ID : T-048
=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.94	.19
ACENAPHTHYLENE	ND	.94	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.94	.19
BENZO(B)FLUORANTHENE	ND	.94	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.94	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.94	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.94	.19
NAPHTHALENE	ND	.94	.19
PHENANTHRENE	ND	.94	.19
PYRENE	ND	1.9	.19

PROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	81	50-130

RL: Reporting Limit

QC SUMMARIES

SW 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS



=====

Client : SES-TECH	Date Collected: NA
Project : CAMP PENDLETON, UST SITE 14131	Date Received: 03/17/06
Batch No. : 06C154	Date Extracted: 03/17/06 17:00
Sample ID: MBLK1W	Date Analyzed: 03/20/06 11:37
Lab Samp ID: SVC018WB	Dilution Factor: 1
Lab File ID: RCZ256	Matrix : WATER
Ext Btch ID: SVC018W	% Moisture : NA
Calib. Ref.: RCZ053	Instrument ID : T-048

=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	1	.2
ACENAPHTHYLENE	ND	1	.2
ANTHRACENE	ND	2	.2
BENZO(A)ANTHRACENE	ND	2	.2
BENZO(A)PYRENE	ND	1	.2
BENZO(B)FLUORANTHENE	ND	1	.2
BENZO(K)FLUORANTHENE	ND	2	.2
BENZO(G,H,I)PERYLENE	ND	1	.2
CHRYSENE	ND	2	.2
DIBENZO(A,H)ANTHRACENE	ND	1	.2
FLUORANTHENE	ND	2	.2
FLUORENE	ND	2	.2
INDENO(1,2,3-CD)PYRENE	ND	1	.2
NAPHTHALENE	ND	1	.2
PHENANTHRENE	ND	1	.2
PYRENE	ND	2	.2

PROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	77	50-130

RL: Reporting Limit

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS



CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
LAB NO.: 06C154
METHOD: SW 3520C/8270C SIM

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: SVC018WB SVC018WL SVC018WC
LAB FILE ID: RCZ256 RCZ257 RCZ258
DATE EXTRACTED: 03/17/0617:00 03/17/0617:00 03/17/0617:00 DATE COLLECTED: NA
DATE ANALYZED: 03/20/0611:37 03/20/0611:56 03/20/0612:15 DATE RECEIVED: 03/17/06
PREP. BATCH: SVC018W SVC018W SVC018W
CALIB. REF: RCZ053 RCZ053 RCZ053

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Acenaphthene	ND	10	5.74	57	10	5.05	51	13	40-130	30
Acenaphthylene	ND	10	6.19	62	10	5.43	54	13	40-130	30
Anthracene	ND	10	6.51	65	10	6.07	61	7	50-130	30
Benzo(a)anthracene	ND	10	7.71	77	10	7.6	76	2	50-130	30
Benzo(a)pyrene	ND	10	7.68	77	10	7.44	74	3	50-130	30
Benzo(b)fluoranthene	ND	10	8.81	88	10	8.63	86	2	50-130	30
Benzo(k)fluoranthene	ND	10	5.88	59	10	6.09	61	3	30-150	30
Benzo(g,h,i)perylene	ND	10	7	70	10	6.68	67	5	50-130	30
Chrysene	ND	10	7.25	72	10	6.7	67	8	50-130	30
Dibenzo(a,h)anthracene	ND	10	7.48	75	10	7.11	71	5	40-140	30
Fluoranthene	ND	10	6.78	68	10	6.3	63	7	50-130	30
Fluorene	ND	10	5.91	59	10	5.23	52	12	40-130	30
Indeno(1,2,3-cd)pyrene	ND	10	7.56	76	10	7.15	71	6	30-140	30
Naphthalene	ND	10	5.91	59	10	5.42	54	9	30-130	30
Phenanthrene	ND	10	6.23	62	10	5.89	59	6	40-130	30
Pyrene	ND	10	6.28	63	10	6.11	61	3	40-130	30

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
Terphenyl-d14	10	6.8	68	10	6.72	67	50-130

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14131

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

SDG#: 06C154

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
SDG: 06C154

METHOD 3520C/8015B TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Five (5) water samples were received on 03/16/06 for Total Petroleum Hydrocarbons by Extraction analysis by Method 3520C/8015B in accordance with SW846 3RD Edition.

1. Holding Time

Analytical holding time was met. Extraction was performed on 03/17/06 and completed on 03/18/06.

2. Calibration

Initial calibration was seven points for Diesel. %RSDs were within 20%. Continuing calibrations were carried out within 12-hour intervals and all recoveries were within 85-115%.

3. Method Blank

Method blank was free of contamination at half of the reporting limit.

4. Surrogate Recovery

All recoveries were within QC limits.

5. Lab Control Sample/Lab Control Sample Duplicate

All recoveries were within QC limits.

6. Matrix Spike/Matrix Spike Duplicate

Sample C154-03 was spiked. Recoveries were within QC limits.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met. Sample results were quantitated from C10 to C24 using Diesel (C10-C24) calibration factor.

LAB CHRONICLE

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14131

FN	- Filename
% Moist	- Percent Moisture

SAMPLE RESULTS

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```
=====
Client      : SES-TECH                      Date Collected: 03/16/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Batch No.   : 06C154                       Date Extracted: 03/17/06 17:00
Sample ID: 0004-135                       Date Analyzed: 03/22/06 05:23
Lab Samp ID: C154-02                      Dilution Factor: .94
Lab File ID: TC21019A                    Matrix       : WATER
Ext Btch ID: DSC016W                     % Moisture    : NA
Calib. Ref.: TC21013A                    Instrument ID : GCT050
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.094	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	90	65-135

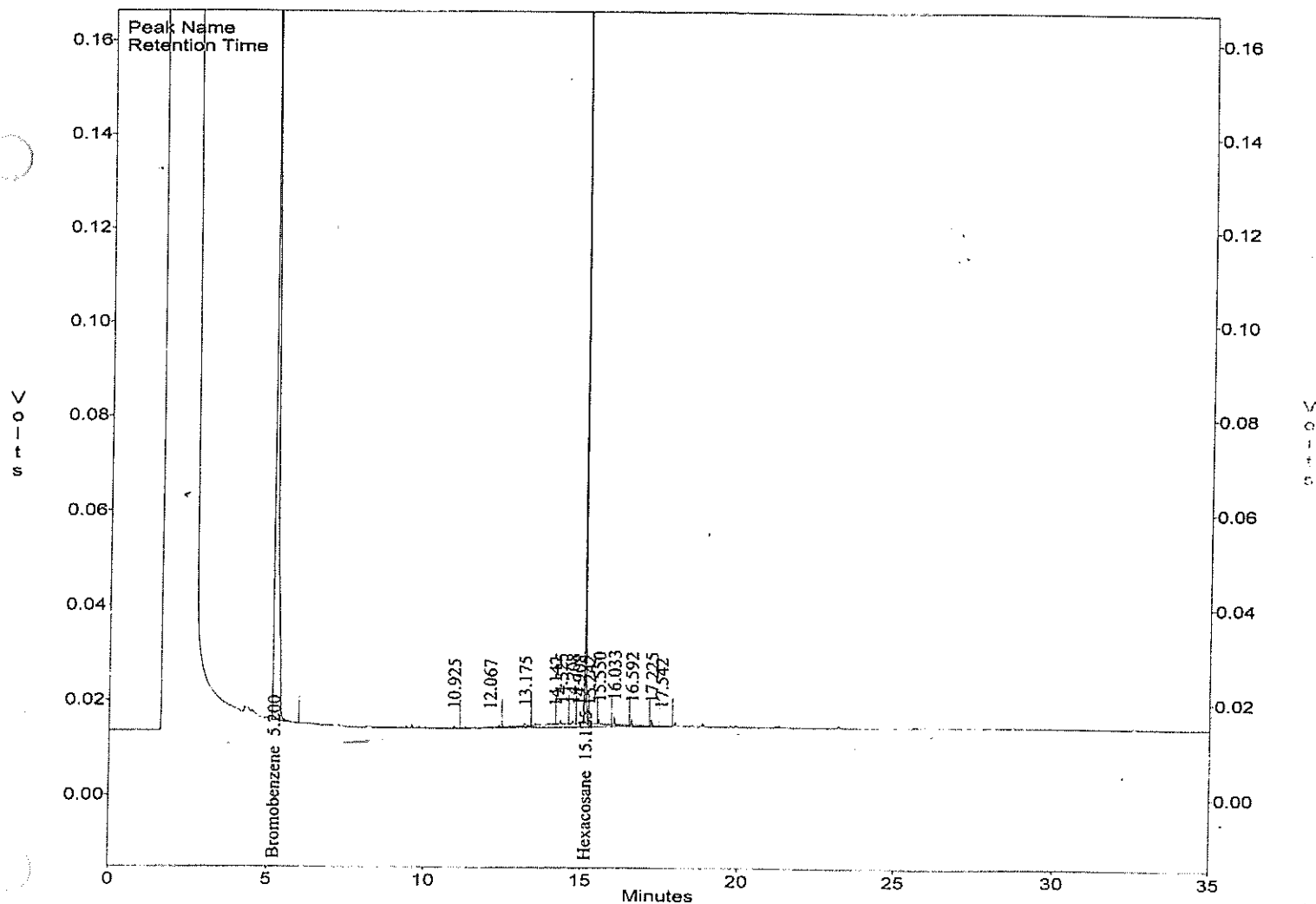
RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tc21\tc21.019
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06C154-02
Acquired : Mar 22, 2006 05:23:30
Printed : Mar 22, 2006 10:12:46
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF.	ESTD Conc. (ppm)
1	Bromobenzene	5.200	991305	14214.3	69.7
9	Hexacosane	15.125	652885	28984.5	22.5
G1	Diesel (TOTAL)		131859	26500.7	5.0
G2	Diesel (C10-C24)		74640	26460.6	2.8
G3	Diesel (C10-C28)		113126	26478.8	4.3

c:\ezchrom\chrom\tc21\tc21.019 -- Channel A



Handwritten signature/initials
3-22-06

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 03/16/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Ch No.      : 06C154                       Date Extracted: 03/17/06 17:00
Sample ID   : 0004-136                     Date Analyzed: 03/22/06 06:05
Lab Samp ID : C154-03                     Dilution Factor: .95
Lab File ID : TC21020A                    Matrix          : WATER
Ext Btch ID : DSC016W                     % Moisture       : NA
Calib. Ref. : TC21013A                    Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.095	.024

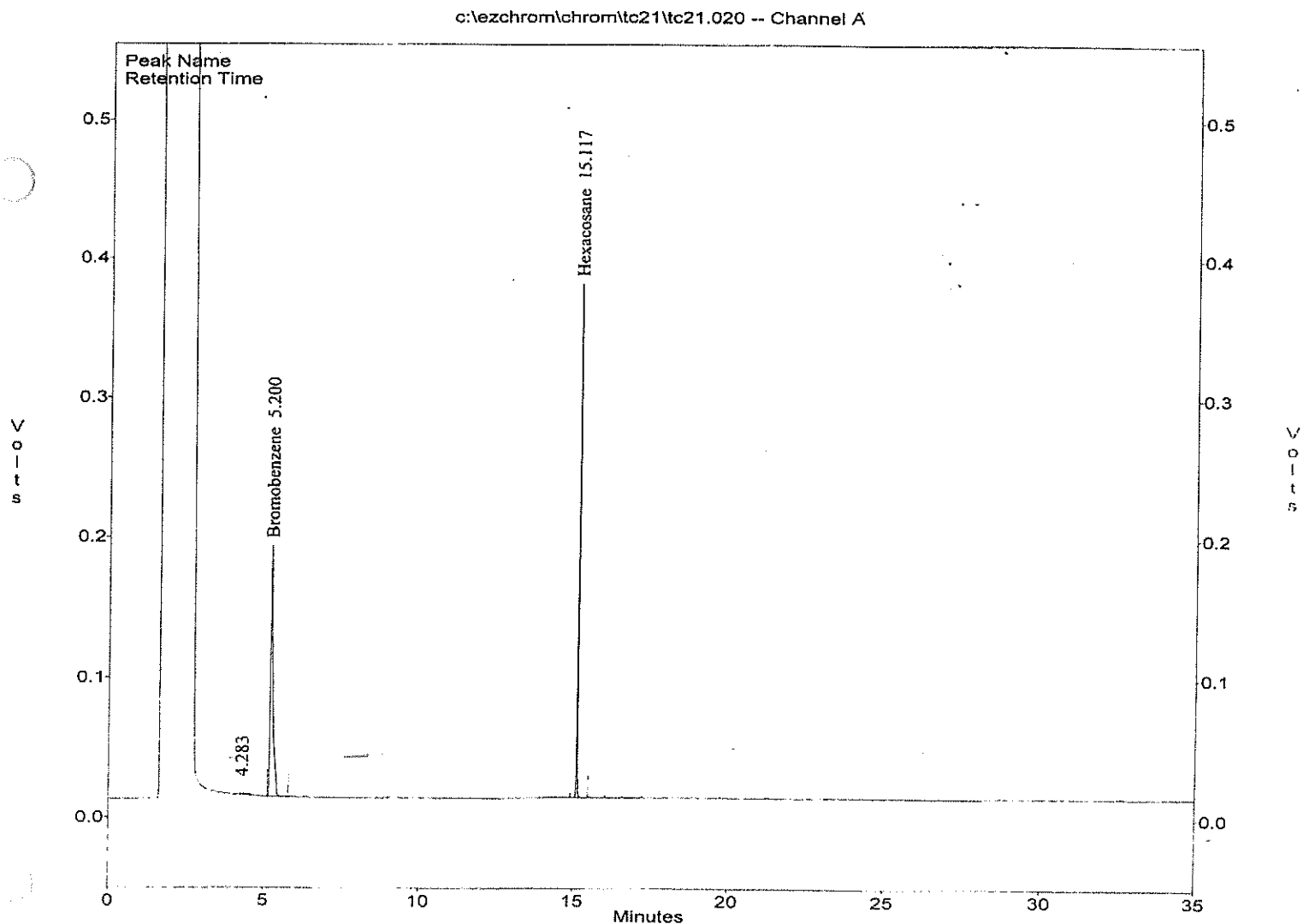
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	86	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tc21\tc21.020
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06C154-03
Acquired : Mar 22, 2006 06:05:09
Printed : Mar 22, 2006 10:12:57
User : JANE

Channel A Results

#	Peak Name	Ret. Time (Min)	Area	Ave. CF.	ESTD Conc. (ppm)
2	Bromobenzene	5.200	1012316	14214.3	71.2
3	Hexacosane	15.117	624402	28984.5	21.5
G1	Diesel (TOTAL)		20894	26500.7	0.8
G2	Diesel (C10-C24)		0	26460.6	0.0
G3	Diesel (C10-C28)		0	26478.8	0.0



METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```
=====
Client      : SES-TECH                      Date Collected: 03/16/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Batch No.   : 06C154                       Date Extracted: 03/17/06 17:00
Sample ID   : 0004-137                     Date Analyzed: 03/22/06 08:10
Lab Samp ID : C154-04                     Dilution Factor: .94
Lab File ID : TC21023A                    Matrix       : WATER
Ext Btch ID : DSC016W                     % Moisture    : NA
Calib. Ref. : TC21013A                    Instrument ID : GCT050
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.094	.024

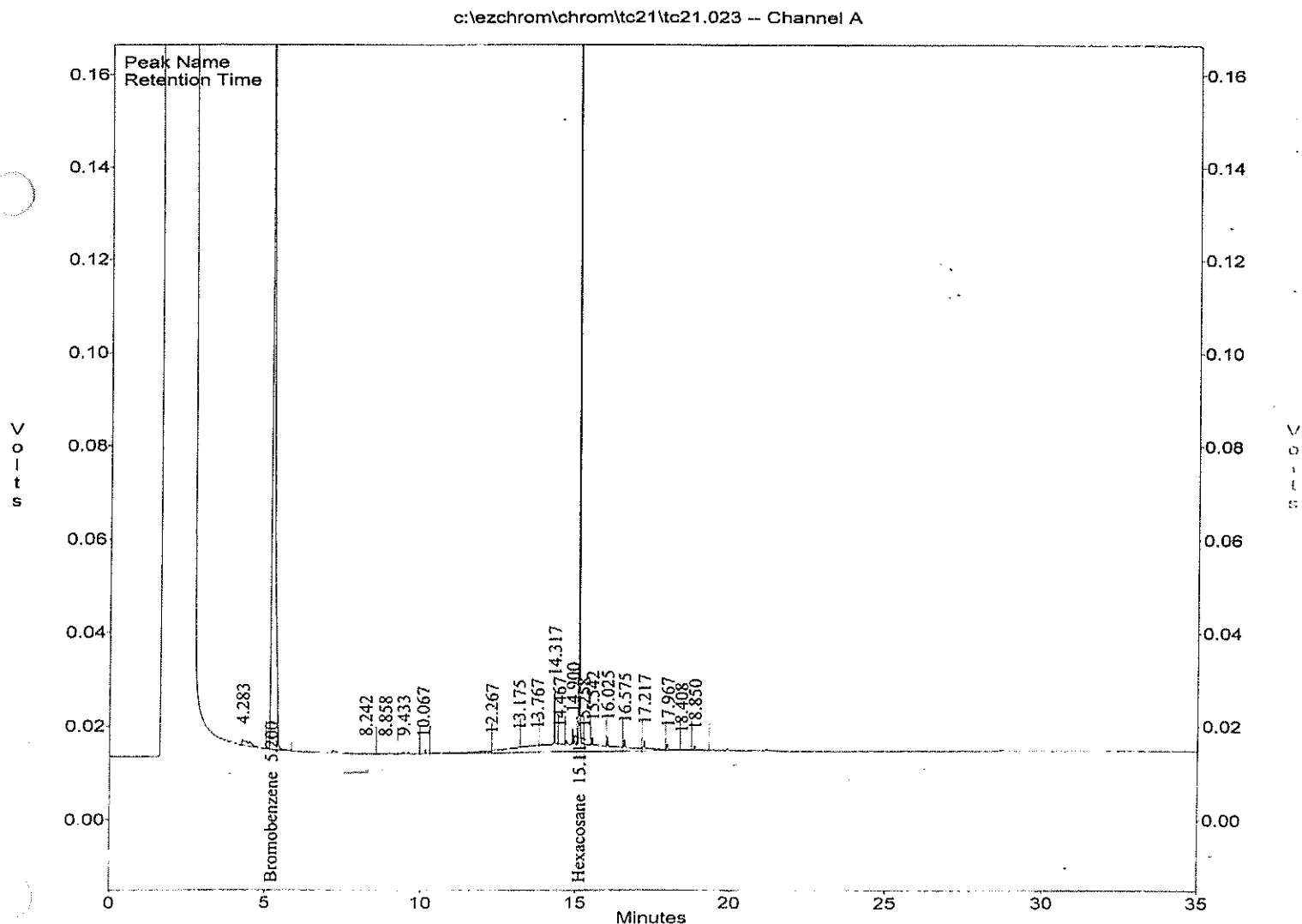
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	81	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tc21\tc21.023
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06C154-04
Acquired : Mar 22, 2006 08:10:10
Printed : Mar 22, 2006 10:16:36
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (ppm)
2	Bromobenzene	5.200	1018156	14214.3	71.6
13	Hexacosane	15.117	583849	28984.5	20.1
G1	Diesel (TOTAL)		384934	26500.7	14.5
G2	Diesel (C10-C24)		196792	26460.6	7.4
G3	Diesel (C10-C28)		294821	26478.8	11.1



03-22-06
5000

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 03/16/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Batch No.   : 06C154                      Date Extracted: 03/17/06 17:00
Sample ID   : 0004-138                    Date Analyzed: 03/22/06 12:21
Lab Samp ID : C154-05                     Dilution Factor: .95
Lab File ID : TC21029A                    Matrix          : WATER
Ext Btch ID : DSC016W                     % Moisture       : NA
Calib. Ref. : TC21025A                    Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.095	.024

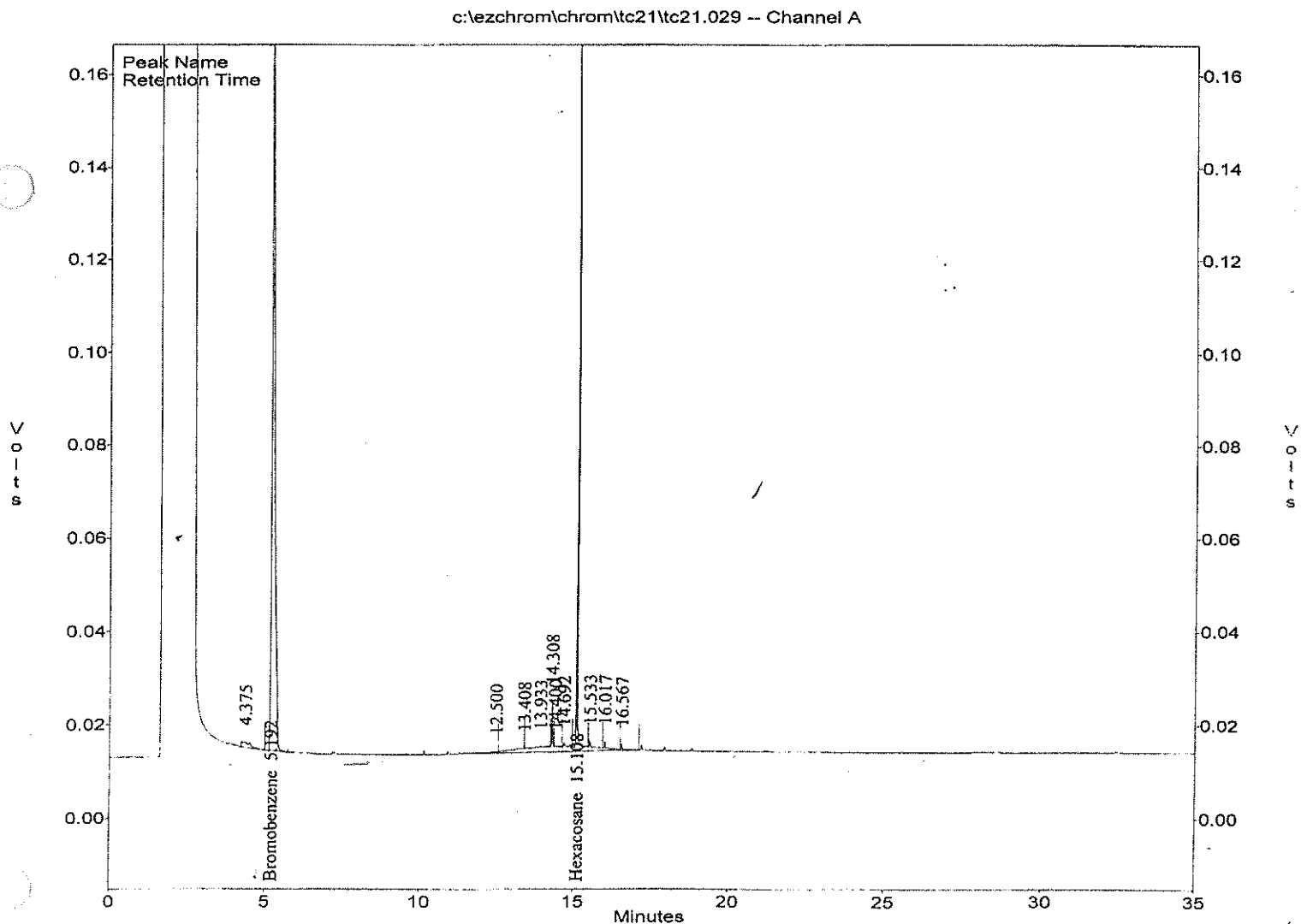
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	65	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tc21\tc21.029
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06C154-05
Acquired : Mar 22, 2006 12:21:55
Printed : Mar 23, 2006 15:35:33
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF.	ESTD Conc. (ppm)
2	Bromobenzene	5.192	929252	14214.3	65.4
9	Hexacosane	15.108	471856	28984.5	16.3
G1	Diesel (TOTAL)		207455	26500.7	7.8
G2	Diesel (C10-C24)		135537	26460.6	5.1
G3	Diesel (C10-C28)		176660	26478.8	6.7



JP
03-23-06
5:35:33

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 03/16/06
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/16/06
Batch No.   : 06C154                      Date Extracted: 03/17/06 17:00
Sample ID   : 0004-139                    Date Analyzed: 03/22/06 13:03
Lab Samp ID : C154-06                    Dilution Factor: .95
Lab File ID : TC21030A                   Matrix          : WATER
Ext Btch ID : DSC016W                    % Moisture       : NA
Calib. Ref. : TC21025A                   Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.095	.024

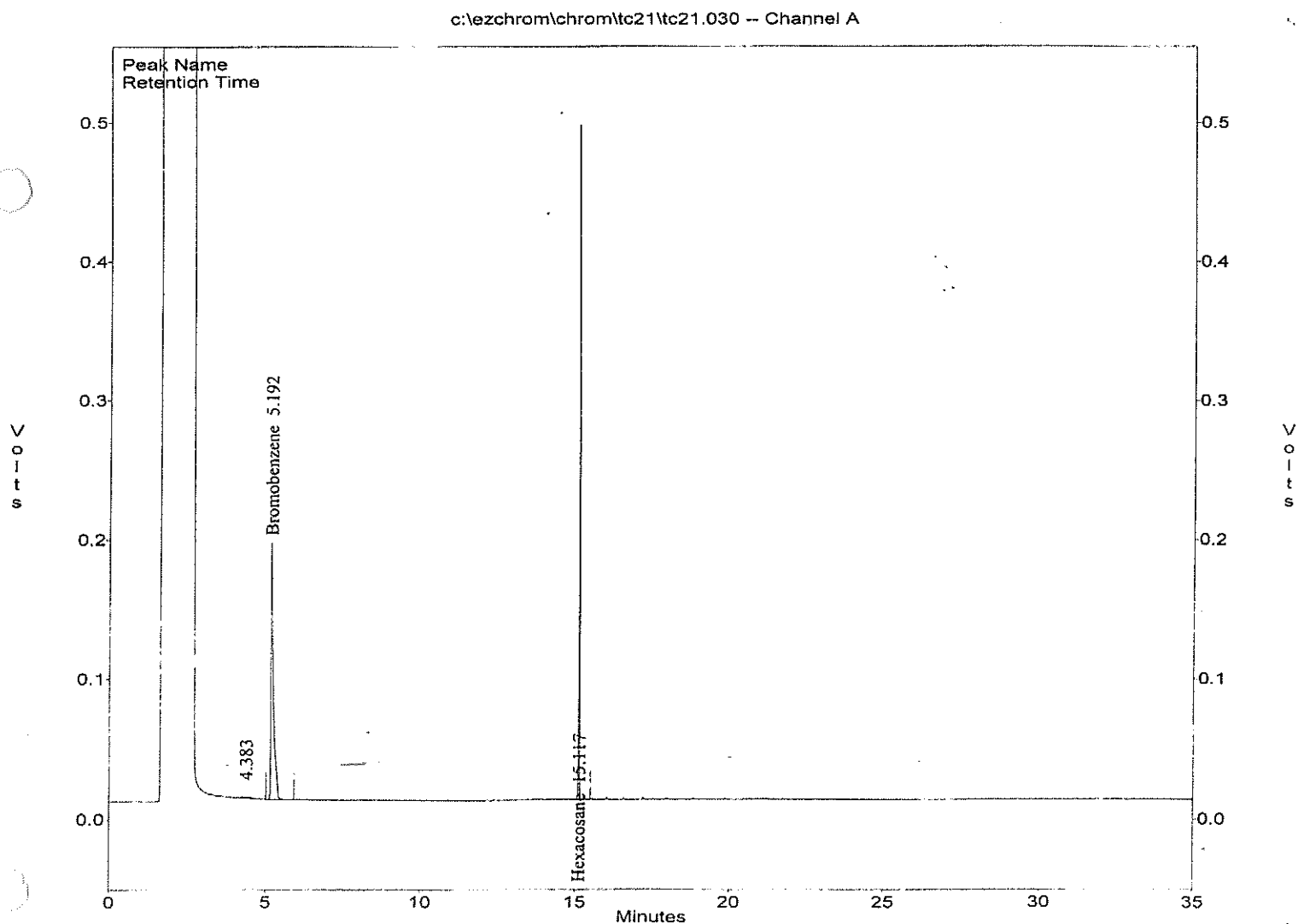
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	106	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

File : c:\ezchrom\chrom\tc21\tc21.030
Method : c:\ezchrom\methods\ds50a31.met
Sample ID : 06C154-06
Acquired : Mar 22, 2006 13:03:57
Printed : Mar 23, 2006 09:48:09
User : JANE

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF.	ESTD Conc. (ppm)
2	Bromobenzene	5.192	1039906	14214.3	73.2
3	Hexacosane	15.117	770655	28984.5	26.6
G1	Diesel (TOTAL)		20987	26500.7	0.8
G2	Diesel (C10-C24)		0	26460.6	0.0
G3	Diesel (C10-C28)		0	26478.8	0.0



QC SUMMARIES

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: NA
Project     : CAMP PENDLETON, UST SITE 14131 Date Received: 03/17/06
Vial No.    : 06C154                       Date Extracted: 03/17/06 17:00
Sample ID   : MBLK1W                       Date Analyzed: 03/21/06 18:14
Lab Samp ID : DSC016WB                     Dilution Factor: 1
Lab File ID : TC21003A                     Matrix          : WATER
Ext Btch ID : DSC016W                      % Moisture       : NA
Calib. Ref. : TC21002A                     Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	113	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
CH NO.: 06C154
MOD: METHOD 3520C/8015B

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: DSC016WB DSC016WL DSC016WC
LAB FILE ID: TC21003A TC21004A TC21005A
DATE EXTRACTED: 03/17/0617:00 03/17/0617:00 03/17/0617:00 DATE COLLECTED: NA
DATE ANALYZED: 03/21/0618:14 03/21/0618:56 03/21/0619:38 DATE RECEIVED: 03/17/06
PREP. BATCH: DSC016W DSC016W DSC016W
CALIB. REF: TC21002A TC21002A TC21002A

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Diesel	ND	5	4.66	93	5	4.71	94	1	65-135	30

SURROGATE PARAMETER	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	QC LIMIT (%)
Hexacosane	.25	.283	113	.25	.288	115	65-135

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14131
BATCH NO.: 06C154
METHOD: 3520C/8015B

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: .95 .94 .94
SAMPLE ID: 0004-136
LAB SAMP ID: C154-03 C154-03M C154-03S
LAB FILE ID: TC21020A TC21021A TC21022A
DATE EXTRACTED: 03/17/0617:00 03/17/0617:00 03/17/0617:00 DATE COLLECTED: 03/16/06
DATE ANALYZED: 03/22/0606:05 03/22/0606:46 03/22/0607:28 DATE RECEIVED: 03/16/06
PREP. BATCH: DSC016W DSC016W DSC016W
CALIB. REF: TC21013A TC21013A TC21013A

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	SPIKE AMT (mg/L)	MSD RSLT (mg/L)	MSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Diesel	ND	4.7	4.35	93	4.7	4.2	89	3	65-135	30

SURROGATE PARAMETER	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	SPIKE AMT (mg/L)	MSD RSLT (mg/L)	MSD % REC	QC LIMIT (%)
Hexacosane	.235	.26	111	.235	.22	94	65-135